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THE

BRITISH

# FARMER'S MAGAZINE.

NEW SERIES.

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Agriculture not only gives riches to a nation, but the only riches she can call her own.—DR. JOHNSON.

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*The cow is a very common animal in the West Indies, and the best of the breed is found  
 in the mountains of the island. It is a very hardy animal, and will live on the most barren soil.  
 It is also a very useful animal, and is used for many purposes.*



*The Hermit's Repose*

London, Engraved by Agnew & Sons, 1840. 1840. 1840.



# THE BRITISH FARMER'S MAGAZINE.

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## PLATE I.

### A PRIZE SHORTHORN STEER,

THE PROPERTY OF MR. J. W. KIRKHAM, OF BISCATHORPE, LOUTH, LINCOLNSHIRE.

This steer, bred by Mr. Luke Harrison, of Donington-on-Bain, Louth, Lincolnshire, was by Orthodox, 25th (18492), dam by Auctioneer (13510), her dam by Hopewell (10332), — by Leonard (4210).

At the show of the Smithfield Club, in December, 1864, when close upon two years and a-half old, the Biscathorpe steer took the first prize of £30 for shorthorn steers within that age; as also the silver cup, value £40, for the best ox or steer in any of the classes, with the customary silver medal for his breeder. We thus wrote at the time of the best beast in the Hall:—"Bred by Mr. Luke Harrison, from the stock of Mr. George Dixon, of Caistor, who some years since sold off a good old-fashioned herd, this steer is certainly a very admirable beast at his age. Reaching out low and wide, with a rare back and body, and good, in fact, in all the good places, he begins with a very handsome head, but with his appearance a little set off by the flashy Oxford colour

of his coat; while he stands badly behind, and at the other end is very bare and poor over his blade-bones. But these were no great drawbacks with the butcher, and Mr. Davis, of the New Cattle Market, secured him at £70. In short, as to this steer being a long way the best of his class, there could be but one opinion; though whether in fully developed use and grandeur—the points, after all, in a fat cattle show—he could compare with either of his opponents, was quite another matter. However, Mr. Topham argued that he might, as Mr. Bowly and Mr. Fowler were easily led into the same view, as eventually was Mr. Rogers; and this settled the business, with Mr. Jones still standing by his Hereford, and Mr. Baker also alone in his advocacy of the Cross, claims. Never was a return more warmly nor more continually canvassed, as public expression may be briefly summed up in this wise:—"The shorthorn men all thought it was right, and everybody else thought it was wrong."

## PLATE II.

### THE HOUSEKEEPER.

There cannot be a cleaner cottage. Tidiness, it is pleasant to know, has for a good many years past been establishing itself, in Scotland, among the minor domestic virtues. Once established, it will never decay; for it must be felt to brighten, more than could be imagined by our fathers, the whole aspect of life. No need for any other household fairy to sweep this floor. An orderly creature we have seen she is, from all her movements out and in doors, though the guest of but an hour. She was born and bred in the country; and her manners, not rustic, but rural, breathe of its serene and simple spirit—at once Lowland and Highland; to a pleasant union, not without a certain charm of grace. We shall lunch ere we go, and lunch well too, for this is a poor man's, not a pauper's hut; and

Heaven still grants his prayer—"Give us this day our daily bread." Sweeter, richer bannocks of barley-meal never met the mouth of mortal man, nor more delicious butter. "We salt it, sir, for a friend in Glasgow, but now and then we tak a bite of the fresh. Do oblige us a', sir, by eatin, and you'll maybe find the mutton-ham not that bad, though I've kent it fatter; and as you hae a long walk afore you, excuse me, sir, for being so bauld as to suggest a glass of speerit in your milk. The gudeman is temperate, and he's been sae all his life; but we keep it for a cordial, and that bottle—to be sure it's a gay big ane, and would thole replenishing—has lasted us syne Whitsuntide."

It is Christopher North who gives our housekeeper and her cottage such a character.



## OUR FISHERMEN.

BY CUTHBERT W. JOHNSON, F.R.S.

We do not commonly feel so grateful to the fisherman as his very important labours well deserve. We seldom, indeed, remember as we should do, that his services are not confined to the gathering from the waters an enormous amount of wholesome food. We should, as agriculturists, recollect that he alone restores to us a large portion of those organic matters which our streams are incessantly carrying away from the soils of our islands. We might usefully reflect upon the fact that every land drain, every mountain tarn, every river, conveys away in a hardly ever ceasing current some of the organic portions of our soils. Now, all these have one great receiver—the sea. In its waters we find a new series of operations, fresh transformations, to excite our curiosity, but all tending to show the beneficent arrangements and power of our Heavenly Father. Those organic masses, which if allowed to decompose in the sea might be the source of pestilence, are partially consumed by fish or sea insects, or are absorbed and assimilated by sea plants, which are also the food of animals.

Thus steadily receiving the washings of our soils, what does the sea restore to those impoverishing lands but fish? For that great return we are indebted to our noble race of fishermen, and what an enormous restoration that is we are all aware. Think of the herring fishery, the shoals of pilchards and sprats, the Norway and the Newfoundland cod fisheries; add to these the catchings of the fleets of boats incessantly employed around our islands in the other sea fisheries (304,923 cwts. of foreign fish were imported in 1868), and how very enormous is the amount of fish restored to our land!

But there are other fishers employed in our service besides the boatmen who tenant our shores. We may usefully remember the sea birds, who also live by the produce of their fisheries. To some extent we are indebted to our own birds; but to a much larger degree are we benefited by those of the Pacific ocean, since to them we owe the guano of Peru. Some papers have been lately published upon the origin and history of this powerful manure, to which we may usefully refer.

The more recent explorations of the Chincha or Guano Islands show that the stock of guano still remaining on these islands is enormous. Mr. Wallace Fyfe, in a very interesting lecture before the members of the Royal Agricultural College, gives a variety of facts relating to these vast collections gathered by the little winged fishers of the Pacific. He observed (*Agricultural Gazette*, 1866, p. 539):

"I may cite the following account communicated by my brother, Lieutenant Thomas Wallace Fyfe, to Mr. Samuel Parr, the Nottingham chemist, as given in that gentleman's 'Letters to Farmers on the Chemistry of Soils and Manures':—  
"Last year Captain Fyfe visited Peru, and brought over from the Chincha Islands a cargo of guano. His account of

these islands is totally different from any I have ever yet seen published, for instead of the guano being exhausted in 8 or 10 years, which most writers assert, he says that the supply, comparatively speaking, is inexhaustible, the beds of guano being in many places more than 100 feet thick, and two of the three principal islands being yet untouched. On climbing the cliffs an innumerable quantity of skeletons of large marine animals were presented to his view, such as those of the seal and walrus or sea-horse, striking up out of the surface in such quantities that the place appeared to be completely white all over; and these account in some measure for the white lumps frequently met with in Peruvian guano, which are no doubt the decomposed skeletons and vertebrae of these animals. Passing along over the island, he could scarcely take a step without his foot breaking through into a hole in which the guano bird makes its nest. These holes extend 5 or 6 yards into the bed of the guano, and the birds are continually occupied in fetching fish from the sea to feed their young ones. The number is so immense that the air seems completely alive with them. By this account, on which the most implicit reliance can be placed, you will perceive that guano is not all excrementitious matter, as we have hitherto been led to suppose, but consists of a considerable amount of decomposed animal matter, in addition to the excrement of birds."

"Acosta (A.D. 1599) is the earliest historian who notices the method of manuring the land adopted in Peru at the arrival of the Spaniards. He notices that the ridges amongst the cliffs and hills of the islands contiguous to the coast are so white that one would imagine they were topped with snow. This covering he describes as an uninterrupted heap, often some yards deep, of the excrement of sea fowl; and vessels go solely for the purpose of loading this dung, so great being its efficacy that the land manured with it produces a much larger crop of grain and also an increased quantity of fruit. It is called guano, and Lunaguano in the Peruvian valleys takes its name from its being there more generally used (*Historia Natural y Moral de las Indias* lib. iv. cap. 87). In the time of the Incas no one could land upon the islands during breeding time without incurring the penalty of death, and at no time of the year was it lawful to kill them. Each island was destined for the supply of a particular province, but if large was allotted to two or three more. In the neighbourhood of Arequipa and Arica, however, where it seldom rains, Garcillasso mentions that the natives manured with pilchards by putting two maize seeds into the head of one of them, and then burying this in a hole made by a dibble. This was out of no disrespect, however, to the value of the guano, for when the wind blows strongly from the sea, the rising tide on the Peruvian coast brings with it immense shoals of pilchards, which being unable to recede when the ebb ensues, are left scattered in immense numbers on the beach. The great object of the Peruvians being to manure the plant rather than the soil, they abstained as much as they could from indiscriminately scattering their guano on the surface or in any other way using it as a top-dressing; because practice had taught them that a substance so volatile easily evaporates, and consequently loses most of its essential properties when exposed to the action of the air. With the aid of guano the ancient Peruvians were enabled to cultivate the same lands for the same crops (maize and millet) and render them permanently productive. To their terraced seed lands no repose was given. In the province of Arequipa, where guano is applied, maize yields 35 and potatoes 45 for 1, whilst in the same districts wheat manured with horse dung does not exceed 18. Much depends on the mode of applying the guano. The mode of application to the red Guinea pepper plant is worthy of recital. The plants are laid slanting on the ground, in order that the trenches for irrigation may bring the water gently to each stem; as much guano is then put to each as will rest in

the palm of the hand, a little more when the flower is formed, and, finally, a good handful when the pod appears. As it never rains, great care is taken to have the plants watered, for the undiluted salts in the manure would be apt to burn them. And practically there is nothing different in our modern modes of applying guano, unless that we perhaps more frequently apply it in the dry form with sifted earth or ashes for a diluent or vehicle. The highest authority on the natural history of this valuable substance is, however, the distinguished naturalist, M. Alcide d'Orbigny, in his 'Voyage dans l'Amerique Meridionale.' He says, 'It would be difficult to explain the nature of accumulations so considerable as these by the ordinary quantity of birds which we are in the habit of seeing upon our own shores; but in America this is not the case. There the great number of uninhabited points enables the feathered tribes to roost and nestle in peace, at the same time that this sea, in a virgin state as regards fishing, and perhaps abounding in the finny race more than any other in the world, furnishes them with an easy means of obtaining a subsistence. Hence it follows that these animals there are so numerous that at certain seasons their various tribes actually darken the air as the flocks move along. All these marine tribes, in consequence of their invariably reposing in large societies on the same points and there passing the night, unceasingly augment the strata of guano; and as it does not rain in that part of the country, the surface is never washed by those heavy showers to which we are accustomed in Europe.' The flocks of birds observed by M. d'Orbigny were of the gull, gannet, pelican, and cormorant, and phaeton families. The island of Iquique, he observes in passing, was formally frequented only by guaneros, or guano vessels, conveying the bird droppings to the neighbouring mainland. The inhabitants, he remarks, had for three centuries been accustomed to provide themselves on a small island situate to the north of Itaque, and not more than a league in circumference. There are, however, other birds to which Dr. Unanue introduces us, as the huancaes, from whose dung, he says, comes that red earth with a pungent and alkaline smell, used as manure on the lands to increase it three or four hundred fold—a discovery made by the ancient Indians, who were consummate masters in agriculture. Upper Peru, it seems, is studded with lakes, but they afford so little fish that their incalculable myriads of aquatic birds, gulls, herons, ducks, &c., come down to the coast, where they remain till the summer sets in. Guano consequently is not the accumulated droppings of one particular bird, although it takes the name of the kind that would appear to predominate. One writer has been curious enough to calculate the probable rate of accumulation of these deposits. The palmipedes or web-footed tribes, he says, the pelican, cormorant, and gannet, are no doubt the largest producers, owing to their size and the quantity of food they devour. Supposing then that there might be one million of each constantly at work, and that each bird voided one ounce weight in the course of the night, the aggregate quantity in that case would exceed 90 tons in the 24 hours, or 32,850 tons in the year, to which are to be added the leavings of numerous other tribes. In confirmation of the accessions of another kind mentioned by my brother, it was estimated by the loaders on the S.W. coast of Africa in 1838 that there were half a million carcases of seals lying on Possession Island, and fully as many more on Seal and Penguin Islands within Angra and Piquena Bay, which must either have fallen victims to some dreadful pestilence, or have been destroyed by one of those awful visitations called sandblasts. Sailors have another opinion. Nothing would convince the South Sea whaler that the creatures did not select for themselves a spot ashore to which they resort to die."

The Peruvian guano contains a considerable portion of uric acid, which is, there is every reason to believe, a powerful manure (it is the powder which we notice deposited on the sides of our chamber utensils). It is composed of:—

Hydrogen	...	...	...	0.125
Carbon	...	...	...	2.250
Nitrogen	...	...	...	1.750
Oxygen	...	...	...	1.800

5.635

The Peruvian farmers much prefer the freshly dropped excreta of the sea-birds of the Guano Islands. Now, the fresh guano is more valuable because it contains a larger proportion of uric acid. We do not possess an analysis of the recent droppings of the birds which frequent the shores of Peru; they would probably be found to differ in some degree, not only with the species of bird, but also with the kind of fishes on which at different seasons of the year they were found to prey. We possess analyses, however, of the excretions of birds which live chiefly upon fish, from which we are enabled to form an opinion as to what the recent guano is likely to be. Thus, Dr. Wollaston found those of the gannet (*Pelicanus bassanus*), when dry, to contain little else but uric acid, while in those of the sea eagle Coindet found:—

## SOLID EXCRETIONS.

	Per cent.
Ammonia	9.90
Uric acid	84.65
Phosphate of lime	6.15
	100.00

## LIQUID EXCRETIONS, DRIED.

Uric acid	59
Earthy and alkaline phosphates, sulphates, and chlorides	41
	100

Some recently reported experiments of Professor Anderson on the use of uric acid for turnips and wheat will be found in "The Transactions of the Highland Society for 1865," pp. 421 to 478. In the turnip trials there were five sections, composed of—1. Soil simple; 2. The calcined ashes of Peruvian guano (780, 860, and 240 lbs.); 3. Uric acid; 4. Sulphate of ammonia; 5. Peruvian guano. The results per acre from these trials were as follows:—

	Tons.	Cwts.
1. Soil simple	...	bulbs 7 7
"	...	5 14
"	...	5 15
2. Guano ash	...	9 11
"	...	7 11
"	...	6 14
3. Guano ash and uric acid	...	11 8
"	...	9 16
"	...	8 5
4. Guano ash and sulphate of ammonia	18	11
"	10	19
"	8	16
5. Peruvian guano	11	14
"	10	3
"	8	15

Comparing, then, observes Dr. Anderson, the results of each section with one another, it is to be observed that in every case the mixture of guano ash and sulphate of ammonia has given the best result. After it comes the guano itself, and then the uric acid mixture. The conclusion, therefore, is favourable to the ready-formed ammonia as a source of nitrogen in this case; but, as we shall immediately see, the experiments on wheat by no means confirm this inference, and it is necessary to inquire how far the particular circumstances under which the

experiments were made may tend to affect the results. The unusually dry weather of July and August were necessarily unfavourable to the decomposition of uric acid.

The manures employed for the wheat were used as top dressings in April, and in quantities less than for turnips. The guano being applied in two series of trials at the rate in section 1 of 360 lbs., and in section 2 of 180 lb. an acre. The result obtained were as follows:—

## SECTION 1.

	Grain. bush.	Straw. tons. cwt.
Soil simple ... ..	37	1 15
Guano ash ... ..	40	1 17
Guano ash and uric acid ...	52	2 7
Guano ... ..	54	2 7
Guano ash and sulphate of ammonia ... ..	54	2 7

## SECTION 2.

	Grain. bush.	Straw. tons. cwt.
Soil simple ... ..	41	1 18
Guano ash ... ..	40	1 16
Guano ash and uric acid ...	49	2 7
Guano ... ..	44	2 3
Guano ash and sulphate of ammonia ... ..	46	2 6

It is of course very hazardous to draw any conclusions from a single set of experiments, but, as Dr. Anderson remarks, they appear to establish that uric acid is capable of promoting the growth of plants, and that as a source of nitrogen it is on the whole equal to sulphate of ammonia or guano.

Some valuable experiments upon different modes of adding to the efficacy of guano were reported not long since by Professor Voelcker. The practical conclusions which he drew from his researches, to use his own words, were (*Jour. Royal Ag. Soc.*, vol. xxv., p. 208), "that he would strongly recommend the addition of about 5 per cent. of oil of vitriol to guano as a cheap and ready means of greatly increasing its efficacy. The expense of so small a quantity of acid is too trifling to require a moment's consideration. Some difficulty," he adds, "I anticipate may be felt in incorporating the acid uniformly with the guano. As the proportion of acid to that of the guano is very small, an intimate mixture cannot be effected by simply pouring the acid upon the latter, nor is it desirable to use the acid in a concentrated state. I would, therefore, suggest the following plan: In the first place dilute the oil of vitriol with about an equal bulk of water, and then sprinkle the dilute acid over dry sawdust, or, if that cannot be had, over ground gypsum or sand. Dry sawdust takes up a great deal of liquid without appearing particularly wet. Gypsum or sand do not take up so much liquid, and must be used in sufficient quantities to absorb completely the acid. By thoroughly mixing the guano, previously reduced to fine powder with sawdust, gypsum, or sand, slightly wetted by the acid, both may be intimately incorporated with each other.

"We have seen in the preceding pages that the efficacy of Peruvian guano may be greatly increased by improving its mechanical conditions, also by the addition of common salt, and especially by treatment with a small quantity of oil of vitriol. I am convinced if the suggestions which I offer are carried into practice, a considerable saving in the expense of the guano will be realized, for it will then be applied to the land in an improved mechanical condition, and in a state of increased mechanical efficacy."

In pursuance of these suggestions, Mr. J. B. Lawes, in the season of 1864, made two sets of experiments with swedes. The results hardly however, in the dry season of that year, verified the reasonable expectations entertained; yet, as Mr. Lawes observes (*ibid* vol. xxvi., p. 213), "Although the season of 1864 was very unfavourable for

roots, and the produce was not more than half a good crop, the results obtained are not without interest.

"Four experiments, making two pairs of two each, were made. In each case 8 tons of farmyard-manure were employed per acre. In the first experiment 200 lbs. of Peruvian guano, in its natural state, and in the second the same amount mixed with a small quantity of sulphuric acid, were used in addition. The third and fourth experiments were, respectively, exactly the same as the first and second, excepting that to each of them there was a further addition of 2 cwt. of superphosphate of lime per acre. 200 lbs. of Peruvian guano were employed per acre in each case. The guano was finely sifted, and that which was to be artificially prepared was well mixed with 20 lbs. of sawdust, which had been previously saturated with a mixture of 12 lbs. of sulphuric acid and 10 lbs., or 1 gallon of water. The guano, or guano-mixture, as the case might be, was sown by hand on the top of the dung before it was ridged in, and the seed was drilled on the ridges, alone in experiments 1 and 2, and with the superphosphate of lime in experiments 3 and 4.

Table I. shows the results of experiments 1 and 2, without the superphosphate:—

TABLE I.

Manures per Acre.	Number of Roots per Acre.	Produce per Acre.	
		Roots.	Leaf.
		Tns. cwt. qrs. lbs.	Tns. cwt. qrs. lbs.
8 tons farmyard manure.....	14,397	9 1 1 4	1 3 3 18
200 lbs. Peruvian guano.....			
8 tons farmyard manure.....	13,092	8 2 2 7	1 3 1 12
200 lbs. Peruvian guano, mixed with 12 lbs. sulphuric acid diluted with 1 gallon of water, and absorbed by 20 lbs sawdust.....			
Difference.....	1,305	0 18 2 25	0 0 2 6

"It is seen that there were about 18½ cwt. more root, and about ½ cwt. more leaf with the guano without, than with the guano with sulphuric acid. There were also about 1,300 more roots per acre without than with the acid. The season was, as already said, very unfavourable for growth, and the difference of the produce in the two cases is comparatively small; but, such as it is, it certainly does not show any beneficial effect from the use of the acid.

"Table II. shows the results of two experiments parallel in every respect with the two former, excepting that with the dung and guano of the one, and with the dung and prepared guano of the other, superphosphate of lime was also employed.

"In this experiment the result is almost exactly as much in favour of the prepared guano as it was against it in the former case. Taking the one set of experiments against the other, therefore, it would appear that in the particular season in question the effect of a given amount of guano was about the same with and without the addition of the sulphuric acid.

"It may be noticed, in passing, that the beneficial effects of superphosphate of lime in preserving the plant in a bad season are very apparent in the much greater number of plants grown per acre when it was used.

TABLE II.

Manures per Acre.	Number of Roots per Acre.	Produce per Acre.	
		Roots.	Leaf.
		Tns. cwt. qrs. lbs.	Tns. cwt. qrs. lbs.
5 tons farmyard manure .....	14,818	8 7 3 2	1 2 1 0
200 lbs. Peruvian guano .....			
2 cwt. super-phosphate of lime .....	15,932	9 5 3 2	1 3 0 14
8 tons farmyard manure .....			
200 lbs. Peruvian guano mixed with 12 lbs. sulphuric acid diluted with 1 gallon of water, and absorbed by 20 lbs. sawdust, 2 cwt. super-phosphate of lime .....			
Difference .....	1,114	0 18 0 0	0 0 3 14

"Taking into consideration both the cost of the acid and the expenses of mixing, the preparation of Peruvian guano, as above described, would probably add nearly 20 per cent to the cost of the nitrogen and phosphates it contains. Unless, therefore, the process be found to augment the efficacy of the guano in more than that proportion, there would be no gain to the farmer in using the mixture instead of the guano in its natural condition. It is obviously very important, therefore, to give the matter a fair and careful trial."

By thus only rapidly glancing at the ever-flowing and reflowing stream of organic matters which the rain removes from our soils, and the fishermen alone restore to them, we must be confirmed in the conviction of the importance of diminishing as much as possible that great drain of the riches of the land, which has, after a long interval, at last attracted the public attention; and, moreover, we may be well reminded, even by a flight of sea-birds, of the great truth that nothing was created in vain.

## ROYAL AGRICULTURAL SOCIETY.

## THE PLYMOUTH MEETING IN JULY.

The migratory principle adopted by the society has at length centred its interest in the four western counties of Cornwall, Devon, Somerset, and Dorset. These counties, like all others, have their peculiarities, which we note as regards soil, climate, and local produce. They are also governed alike by natural laws and geological position.

The society has already held meetings at Bristol, on the confines of Somerset in 1842, at Exeter (in Devonshire) in 1850, and at Salisbury on the borders of Dorset in 1857, the results of which were highly satisfactory; while the present determination to break new ground towards the "Land's End" cannot fail to lead to improvement in the breeds of stock, implements of husbandry, and science of farming in the county of Cornwall.

As a proof of the interest felt by the extreme west in these meetings for the improvement of agriculture, it may be stated that the visit of the Bath and West of England Society to Truro in 1862 was one of their most successful gatherings, both in reference to the stock exhibited, to the attendance, and the receipts. The population of the united towns of Plymouth, Devonport, and Stonehouse, amounted at the last census to 127,382, being the largest aggregate urban population in England, south of the Great Western Railway terminus at Bristol. The facilities for accommodating visitors in the three towns are unusually great; the means of conveyance by railway and water are ample; the former on the east with all parts of England, on the north with Tavistock, Launceston, and other important agricultural districts, and on the west with Cornwall. The communication by water is especially entitled to consideration for the conveyance of stock and implements from Ireland, the Channel Islands, and the Continent, steamers being available for the conveyance of cattle and machinery. Upon the subject of railway accommodation, the chairman of the South Devon Railway (from Exeter to Plymouth) reports:—"The full details of train arrangements for the occasion have been carefully worked out in a manner liberally to provide for the additional without undue interference with the ordinary traffic, and an official intimation has been conveyed to us by the Great Western Railway that we may rely on their assistance in the provision of engine power and rolling stock." Thus, the several towns

on the picturesque coast line of South Devon and Cornwall may easily be reached by a return ticket. The extent of the show-ground, which is close to the town of Devonport, is 35 acres, to which a railway siding will be laid down. The trial-ground, situated at Woodford Farm—say, 1½ miles distant—is of easy access by rail on the Tavistock line, or by road from both the town and show-yard. The trial grounds have been carefully selected, and the crops prepared to meet the wishes of the Council.

## ACRES. CROPS IN JULY.

		IMPLEMENTS.
15...	Meadow .....	{ For trial of mowing machines, hay-making machines, & horse-rakes. 10 acres planted for the trial of horse-hoes; the remainder to be left, but prepared for the trials of turnip drills, &c.
17...	Roots .....	
14 {	Mixed clover and rye-grass .....	{ 8 acres to be ready for the trials of mowing machines, the remainder to be ploughed the usual depth & left for the trials of corn drills
20 {	Rye after wheat 10 acres. Winter oats and rye 10 acres .....	

In addition to the usual list of prizes offered by the Society for the established and other breeds of stock, which amounts this year to £2,875, exclusive of the implements, the local committee, with the assistance of a few Devon breeders, have added the sum of £502 for local prizes; and it is equally gratifying to learn that this spirited offer has been responded to by a liberal entry. To the tourist, who follows "the Royal" as a double outing, may be held out the Cornish sights of mines, mountain scenery, and that beautiful coast line.

## CORNWALL

Is a peninsula with hilly surface at the south-west corner of the Island, its extremity west being the "Land's End," the summit of which is about 400 feet above the sea. "Lizard Point," at the south-western extremity, is famed for its lovely scenery, which is rarely surpassed in the kingdom. Its extent from the

Land's End to the Devonshire border is about 70 miles, and its reputed circumference 250 miles, and contains about 850,000 statute acres, at least one-fourth of which are unclosed waste lands. The high grounds of Cornwall, through which the old turnpike roads pass, present a dreary prospect, but there is a great deal of beautiful scenery on the southern coast, particularly at the Lizard Point; Falmouth and Mount's Bay are exceeded by none. East and West Looe, with Polperro (the three great Pilchard fishing villages) are singularly romantic and interesting. Fowey, with its beautiful bay and inland scenery, is worth seeing. The banks of the Lynher, near Tremarton Castle and Notter Bridge, as also the banks of the Tamar, are very fine. The more remarkable and interesting scenery is along the bold and abrupt line of coast bounded by the Atlantic Ocean and the British Channel, where, amidst a great variety of striking objects, may be seen the magnificent groups of granite rocks at the Land's End, Cape Cornwall, and Castle Tryern, the rocks at Tintagel and Bassit's Cave, with a lofty perforation called "Tabbin's Hole."

The north-western coast has its own peculiar scenery; and Bude Haven, a small watering place, is worth seeing. Stretching away still further north, we have Hartland Point, Lundy Island, and Clovelly; also, on the more northern coast, Ilfracombe, Lynton, and Lynmouth. An excursion to the Scilly Islands by steam packet from Penzance is worth consideration. These islands are about 300 in number, of which 40 bear herbage, but only 6 are inhabited. These contain 3,400 acres, and have a population of about 2,500. St. Mary's Island, the largest of the group, is about 9 miles in circumference. It may be easily "circumambulated" in a day. One of its most notable "lions" is the park in connection with the Elizabeth fortress of Star Castle; here Prince Charles resided in 1645. The produce of Cornwall, apart from agriculture, is tin, copper, lead, most of the semi-metals, china, stone and clay, slate, transparent quartz; pilchards and other fish, with early potatoes, broccoli, &c. As an instance of the latter trades we give an official statement:—

*Fish, Broccoli, and Potatoes conveyed from West Cornwall and Cornwall Stations to South Devon, Bristol and Exeter, Great Western, London and South Western, and Somerset and Dorset Railways, during the year 1884.*

	TONS.	CWTs.
Fish ... ..	2,470	0
Broccoli... ..	2,179	0
Potatoes... ..	3,186	15

*Fish conveyed from South Devon Stations to Stations as above.*

	TONS.	CWTs.
Fish ... ..	3,035	11

**CORNISH AGRICULTURE.**—This is the county of Sir H. Davey, who became the pioneer in agricultural chemistry. It is also the land of farmers, of whom Frazer wrote thus in his "Cornwall 1794": "These men are remarkable for their hospitality, courtesousness, and liberality." The landed estates in this county are most varied, being often vexatiously intermixed; while, on the other hand, there are many fine and extensive properties with substantial English parks. In the hill districts, small farms, fields, and farmers predominate, who perform the chief work on their farms, and pay high rents for the spots with which they are accommodated. Some of these are beautifully managed, while others remain little better than waste, the rent being made up from other resources consequent upon a mining or fishing district. Many gentlemen and clergymen occupy their own estates and glebes, and keep their grounds in capital order. The farmers and breeders proper usually occupy from 150 to 500 acres of land; some devote their attention to corn, while others are really strenuous in the improvement of pasture and meadow lands, by far the most paying and popular pursuit in a humid county. Still, there are many farms south, that will repay spirited husbandry.

The farming of Cornwall has steadily progressed, even rapidly in some districts, since Mr. Karkeek's prize report on the farming of Cornwall was written, some twenty years ago, in which the Royal Cornwall Agricultural Meetings have played their part. They now boast of high farming, steam engines, pedigree bulls, and better grass lands. It would appear from the data given by Mr. Karkeek, as to the breeding and

feeding of stock about 1845, that the Cornish sheep had been improved by an early infusion of the Leicester blood from the flocks of Bakewell and others. Of cattle, he writes: "The original breed are of a black colour, but few only of these are found at present. The Devons are now the prevailing breed." Again: "Within the last 22 years (prior to 1845) Shorthorns have been introduced on many farms. These laid the foundation of the Shorthorned breed in Cornwall." In our knowledge several companies have been formed, and some very good animals have since been introduced.

The farm-buildings in Cornwall are by no means good: they still partake to a great extent of the old "cob wall and thatched roof" system. But happily these are gradually giving way to "stone and slate," and in no instance do we see them replaced, except by some little man who has to struggle against the first outlay. The expenditure for commodious buildings has in some instances been carried too far—this excess will soon dawn.

**CLIMATE.**—The effects of climate within the limits of the four western counties are most variable and remarkable; for as we find the moist vapour exist or decline, so have we the corresponding indications of agricultural produce. Thus, if we first take the more western county of Cornwall, which stretches its broad acres to the West Atlantic gales, we find the occupiers of land employed in the production of succulent plants and roots for stock farming; and as these south-western winds empty themselves while passing over to the east, so do the agricultural art and produce change, the rainfall in the west being about double to that of the east.

## DEVON.

This is the second largest county, containing about 1,650,000 acres of strongly marked hilly surface. There are about 500 parishes. This county abounds with picturesque and romantic scenery, as well as with extensive views. On the eastern extremity are the Blackmoor Hills, a continuation of the ridge which runs through a great part of the kingdom. Leaving Exeter for Haldon, a contrast is afforded by the gradual rising of the hills into commons, bordering upon the Dartmoor Forest, on which "High Tor" forms a conspicuous object in the distance. The central and northern parts of the county preserve the vale and undulating character of Devon, while the southern is a fine richly wooded, well cultivated country, generally pretty level, with the exception of the southern Hams, a most fertile district. Dartmoor, some 1,500 to 1,800 feet above the sea, is the highest ground in the county. From the perpetual recurrence of hills in this county, and their steepness, together with the depth and narrowness of the roads, between high fences, all prospect of the country is shut out, excepting upon the open tops of the hills and where there are no inclosures. From these elevated points we have most remarkable and extensive scenery.

The banks of the rivers in South Devon, such as the Axe, the Otter, the Exe, the Teign, the Dart, the Plym, the Tamar, the Tavy, and the Torridge, afford most lovely scenery for the tourist, and are much frequented. The north of Devon abounds in wild and picturesque views, and its now fashionable watering places of Lynton, Lynmouth, Ilfracombe, Clovelly, and Northam Burrows, with its new hotel, "Westward Ho!" are thronged with visitors during the summer months. Lundy Island, in the Bristol Channel, containing about 2,000 acres of rough land and pasture, is now let to the "Lundy Granite Co.," who have several hundred men upon the island employed in raising granite. This island is within easy distance of "Northam Burrows," but usually approached from the picturesque watering-place of "Clovelly"—famous in history.

The climate in North Devon is less mild than in the South, its enemy being the prevailing north-western gales from the Atlantic. Stock-farming is the general occupation of these tenants; and it may be truly written of the real Northern man, that they revel in their water-meadows, North Devon cattle, and Exmoor sheep and ponies.

The North Devon cattle are of world-wide fame; and the beauties of the breed are never set more prominently before the public than when displayed in the "long red line," at the Society's meetings. The animals exhibited by the Messrs. Quardy at the Exeter Royal, in 1860, and those exhibited by Mr. James Davey, of North Molton, at the Battersea International Meeting, will not readily be forgotten. But, if

prizes will bring them out (£441), the Plymouth Royal will be the sample gathering of all the gatherings of North Devon cattle.

The Exmoor sheep inhabit the northern hills. They are not confined to large breeders, but chiefly held by the smaller ones, who have "runs" on the adjacent commons for summering them. The wether sheep are kept to the age of five to seven years simply for their fleeces, and then fatted on the farm. Some 80,000 of these sheep, old and young, depasture the mountain and hilly lands of West Somerset.

The farm-horses of North Devon have been "crossed up" from the pony-mare. The "pack horse," famous in history, has disappeared with the smuggling trade.

**WATER MEADOWS.**—The North of Devon is truly the land of water meadows. Each farm has its meadow or meadows, in strict conformity with the holding. These are usually placed below the farm buildings, that every advantage may be taken of the passing streams and the sewage of the yards. These may be viewed in the North Molton, Molland, and Dulverton districts. The hillside, or "catch meadow," system may be best understood by a visit to Emmett's Grange, on Exmoor. Large tracts of hillside lands, now lying waste, might easily be brought into profitable use by means of irrigation from the mountain streams.

The Devon County School, situated at West Buckland, has now become as familiar as a "household word." Its foundation and history are patent to the reader of agricultural literature; and the success attained by twenty-two of the scholars at the recent University Examinations is already well known. About half the boys are sons of farmers, somewhat more than a fourth are sons of professional men, and less than a fourth sons of tradesmen. There are about sixty-five boarders.

### SOUTH DEVON

Is famous for its cider, and, according to Grant's Essay, alike famous for "small fields." This survey extended over 37,000 acres, within a circuit of fifteen miles round Exeter, and was confined to land under tillage, the result being 1,650 miles of hedges, occupying 2,642 acres, or 7½ per cent. These are now rapidly giving way to larger fields, farms, and farmers.

South Devon, as a whole, is well farmed, and of a most productive order. The red sandstone soil prevails. The local subject of inquiry, after all, is, "How are you off for water meadows?" Doubtless many will remember the very interesting display and irrigation of the "Killerton Meadows" at the Exeter Royal meeting, in 1850, and at the Salisbury meeting, in 1857.

There is a considerable extent of waste land in Devon, of which there are about 260,000 acres at Dartmoor, being more than half the waste land in the county. Dartmoor Forest, like all other mountainous lands, has its share of swamps, bogs, and heather waste, with anything but a desirable climate. Snow in winter, and rain, fog, &c., in summer, are the more familiar accompaniments to a rugged occupation, with mountain sheep and ponies, specimens of which will be shown at the Plymouth meeting.

Prince's Town, the site of Dartmoor Prison, has been cultivated at a considerable cost, by clearing away the granite boulders, draining, fencing, &c., but not to a profit. The discipline at the Prison is first-rate, and, so far as it can possibly be managed, is self-supporting, by the varied labours of the prisoners. The shoemaker mends the shoes, the tailor mends the clothes, and so forth; while others plough and sow, drain, fence, and build, as their turn may be, all under the constant eye of staunch and steady guards. Dartmoor Prison was once the depot of 10,000 prisoners of war.

There are about 50,000 acres, included in the Forest, belonging to the Prince of Wales as Duke of Cornwall.

The Dartmoor sheep is a hornless sheep, with grey or tanned face and legs. He is low-standing, with long, wiry wool, full of bone, and a slow feeder. He will bear any amount of hardship, and is usually kept to a "good old age" for his fleece, and is then fattened (P), as "Dartmoor mutton," for the London and other fashionable markets.

The **SOUTH HAMS** district, at the southern foot of the Dartmoor Hills—famous for its local breeds of "South Hams cattle and sheep," which are this year recognized in the Society's Prize Sheet—has a wide fame in South Devon. It is mostly on the south side of the South Devon Railway, and running from Newton Abbot to Plympton and Plymouth,

and embraces an area of about 150,000 acres, of which from twelve to fourteen per cent. is in pasture and meadow lands. The farms range from 100 acres upwards, the majority being from 150 to 180 acres.

The South Hams cattle are of large dimensions, tall on the leg, yet deep in carcase, with flat sides, and, in too many instances, irregular frames. They are of a pale red colour. They are noted milkers: and the steers, although far from showyard animals, grow large when fattened up. These animals, without changing the breed, are capable of being improved by selection and better keep.

The South Hams sheep, proper, are of precisely the same build as the cattle; and local prejudices in their favour runs quite as strong as for their companions. These sheep have large frames, with long, coarse wool, and coarse bone. They have usually some grey or tan about them, similar to the Dartmoors. Some flocks have recently been crossed with Lincoln rams.

### SOMERSET.

This county is well placed. It is about 70 miles in length from east to west, and 85 miles from north to south, embracing an area of 1,052,800 acres. There are 472 parishes. Somerset displays a great variety of soil and surface, chiefly meadow and pasture land, yet hilly and mountainous in some places, especially in the Western district, where the Exmoor range of hills run on in line with the Bristol Channel. Exmoor Forest, at the extreme west, on the borders of North Devon, is about 1,000 feet above the sea; while Dunkery, at its extreme east, rises to an altitude of nearly 1,800 feet.

**THE QUANTOCKS.**—These range from 1,000 to 1,100 feet above the sea. This neighbourhood, and to the westward, is beautifully interspersed with rich valley-lands, of which Portlock Vale, Dunster Marshes, and the Timberscombe Meadows form a prominent part. The drive from Bridgewater, through Stowey (the land of Farthing's Devons), Williton, Dunster, Minehead, Portlock Vale, and over the open moors to Lynton and Lynmouth, is one of the finest rides "by coach" that yet remain to the tourist. The varied views of the Bristol Channel, and mountain scenery, with its blooming plants of heather, furze, and grasses, form a marked contrast to the surrounding valley-lands.

The native hill-farmer is proverbially a stock-man. He is averse to inroads and rapid changes, yet his progress is steady, and in support of his "hill-flock" with his little dairy and meadow lands, he toils on. He and his rising family perform the labours of the farm, or nearly so.

Exmoor Forest, now disafforested, contains 20,014 acres, of which about 16,000 acres are the property of Mr. Knight, whose father first bought the Crown lands of some 10,000 acres, about forty years since; and subsequently, the allotment of about 4,000 acres belonging to Sir T. D. Acland, Bart., took place. Other purchases have followed.

The best **MARSH LANDS** are to be found on the Bridgewater Levels, as viewed from the Bristol and Exeter Railway, *en route* for the West. The highest-rented land is that at Pawlett's Hams. The lands on the banks of the Parret generally are very valuable. The second-class grass land (the dairy land) is the greatest in extent.

Cheddar cheese is the staple produce from these farms. Each cow requires nearly three acres—viz., about one-and-a-half acres for summer grazing, and rather more than an acre for hay and after-grass. These cows, on an average, yield 3½ cwt. of cheese, and on good land nearly 4 cwt., in the course of the year.

**CATTLE.**—The larger Devons, or what is commonly termed the "Somerset Devon," claim the highest stand as a country breed, and usually make a good display at the agricultural meetings. The leading breeder and prize-taker of this class of Devons is Mr. Walter Farthing, of Stowey Court.

There are several herds of North Devon cattle in the county; dairy-farming predominates, and as these breeders sell so many calves, it is to be lamented that they are not more particular in the selection of their male animals. The common shorthorn is usually preferred for dairy purposes. There are also some few Herefords.

**SHEEP.**—The long-woolled sheep of the county have no especial claims—no county breed. They are usually of a thick-set, substantial character, with a dash of the Leicester among them; neither are the short-woolled sheep of special form or origin.

The more remarkable county sheep are the improved Dorsets, now designated "the Somerset Dorset horns." This sheep is of good size, rather lengthy in carcase, upon rather tall legs, but yet well turned in his body, with a most picturesque countenance, pure white nose, and long curly horns. There are classes for these sheep at the Plymouth meeting.

The Exmoor is also a horned sheep, but dissimilar in every respect to the Dorset; he has a thick, yet low-grown frame, upon short legs, has a jet-black nose, with open and flat-grown curly horns, and a large tuft of wool on his forehead; they carry excellent thick-set fleeces. The usual practice of these breeders is to clip their lambs at shear-day. This practice is adopted with a view to shorten the wool, that they may not be "washed" so much by the prevailing rains that occur upon the hills. The lambs are dropped as early as the month of January; they thus become strong and hardy for enduring an "Exmoor winter."

Fat wethers on the Exmoor breed have already appeared in public at the Smithfield Club shows, and the breeding animals will be seen in good force at Plymouth. These, with the Dartmoor mountain sheep, are to be exhibited in their wool.

### DORSET.

This county is about 55 miles from east to west, and from north to south 35 miles; circumference 160 miles. The form of this county is everywhere irregular; its surface is rather uneven, and in many parts hilly. A large proportion of the county is appropriated to pasture, and numbers of capital sheep and cattle are fattened in the vale of Blackmore, which is about 14 miles from east to west, and 10 from north to south. This is also a celebrated cider district. The greatest extent of waste land is on the south-eastern side of the county from below Bere Regis, southward towards Lullworth and the sea, extending beyond Corfe Castle to the Hampshire border. There are also open and unenclosed parts, covered with numerous flocks of sheep, which feed in great measure on the produce of the Downs.

A considerable amount of flax has been grown around Bridport, the village of Bradpole, and Beaminster. The chalk district is the land of farms and farming, and especially

from Woodyates to six miles beyond Dorchester; yet the soils on the chalk vary greatly. The improvements effected by Lord Portman at and around Bryanstone, as also upon his lordship's general property, are worthy of notice. Mr. Farquharson, of Langton, also farms well and largely upon a chalk subsoil, every operation of the farm being conducted upon modern principles. About 6,000 sheep are kept on these farms. Steam-engines are now in common use in Dorset. Mr. Saunders, of Watercombe, who occupies about 900 acres of light land, chiefly on the chalk, is another noted farmer in Dorset. The Rev. A. Huxtable's farming, sheep and pigs on boards have long been before the agricultural world, and hence Sutton Waldron has become famed in history.

**CATTLE.**—The old Dorset cow was a longhorn, white-backed, with short dark stripes over the body, and was considered to be as true to the county as the Devon to the locality whose name it bears. Yet the Devon cattle, especially the North Devon, have been freely and liberally introduced to the county by both noblemen, yeomen, and farmers—so much so, that Dorset has of late made a most fortunate exhibition at the different agricultural meetings.

The Dorset pig, in the hands of Mr. Coate and others, has not suffered by propagation. He is now a leading and substantial commodity at the meetings, and is indeed an excellent specimen of the "swinish multitude."

The Dorset sheep have already been spoken of in connection with the "improved Somerset and Dorset horns." In support of this apparent amalgamation, we quote from an old writer, who says—"The sheep of Dorset are well-known as supplying the metropolis with 'house-fed lamb' at a very early period of the year." Parkinson considers the Dorset ewe "as the best horned ewe in the kingdom, those of Somerset excepted," and they are so nearly alike, that few people, save the natives of the two counties, would know the difference. The lambs which are bred for the flock are dropped at Christmas; these sheep go to fold, and are kept within the hurdles as much as any sheep we know. The draft-ewes are usually sold to dealers, forward in lamb, at 4½ years old, who resell them to the graziers and farmers in the midland counties for early lamb.

### FLAX CULTURE.

"What of the supplies of raw material for our flaxen goods?" is a question which at this time demands especial attention of spinners and manufacturers. During the last four years the increased use of such manufactures has far exceeded all anticipation, and the progress of the trade is likely to go on even if cotton should become as cheap and as abundant as it was in 1860. The disposition and general taste for the use of linen as an article of clothing has been wonderfully advanced by the cotton famine; and while extended consumption at home and in the markets for its sale gave new impetus to production, and caused immense extension to be made in the mills and factories of the United Kingdom, the foreign supplies of flax are less liberal than they were twelve years ago.

There are at present in the flax-spinning mills of these realms about a million and a half of spindles, and in the weaving factories there are eighteen thousand power-looms. Raw material to feed these spindles is a necessity only second in importance to that of bread for the support of the operatives; but although an increased growth has been going on in Ireland, not the slightest advance in flax culture is to be seen in the other parts of the kingdom. Then as to foreign importation, the supplies have not increased of late years. In 1790 the total quantity of flax landed at the different ports was only 275,250 cwts. Demand became greatly extended during the first quarter of the present century, and in 1833, when flax-spinning by steam power had made considerable progress, the imports were 1,129,630 cwts. Twenty years afterwards still further extension had been made, and the supplies from foreign ports reached the large amount of 1,992,000 cwts. Since that period the import has fallen off considerably. There were only 1,404,800 cwts. imported in 1860, and in 1861 the supply had declined to 1,333,080 cwts. Even last year, with all the stimulants of extra demand and high prices, the gross import

only reached 1,842,940 cwts., a quantity much under that taken in 1853, and when the consuming power of the trade was not two-thirds as great as it is at present. It should not be forgotten, in considering the question of future supplies from the continental growers, that the flax spinners and linen manufacturers of those States have not been lagging behind in the race of competition. Untrammelled by many of the fiscal fetters that bound their manufactures, the capitalists of France have pushed business to an immense extent since the introduction of freer commerce with that nation, and consequently a large proportion of the flax grown there is now being worked up at home. Belgium has also been extending her means of consumption of raw material, and in Holland an equally energetic movement has been going on. Russia, from whence we have three-fourths of all our foreign supplies, has nearly illimitable resources for the cultivation of flax, but her lands produce only coarse qualities.

Previous to the extended use of cotton in England the culture of flax was almost general; most of the northern counties farmers sowed more or less each season; and as superior qualities were produced off the low-lying lands of Yorkshire, there was raised a class of fibre almost equal to Belgian, and the farmers of Dorset were no less famed for their remarkable skill in the art of flax-growing. Bounties were at one time paid by the State and premiums were awarded by the land-owners for the encouragement of that department of husbandry. The farmers of Devon received in a single season about three thousand pounds; and yet, after all, the patrons of flax culture had immense up-hill work. The founder of the firm of Marshall and Co. made great exertions and spent large sums of money in trying to stir up activity in the same direction among the farmers of Yorkshire at the commencement of the present century, but even he, too, with all his energy and enterprize,

made little headway, and for years past the culture of the flax plant in Devon, Dorset, and a few other counties is much more for the seed than the fibre. When the spinning of yarn and the weaving of linen formed a large source of employment at certain seasons of the year in the rural districts of Scotland, a considerable quantity of flax was raised there, and large quantities of yarn were exported, but the cheapness and popularity of the Asiatic fibre gradually lessened the demand for the home-grown article. Cotton took the lead of all materials for clothing, and for the last twenty years the average extent of soil under flax in all Scotland would not exceed two thousand acres.

From a host of causes, then, Ireland has long been the seat of flax culture for the whole kingdom, but there, too, the growth is almost confined to the northern provinces. Leinster, Munster, and Connaught contribute comparatively little to the aggregate bulk of fibre annually grown. In the days when the Irish trade was held under the patronage and control of the Linen Board, great exertions were made to increase the growth of flax in all parts of the island, and on the whole much success followed the labours of those trustees. Seed of the best quality was purchased, and sold at low prices to the farmers, and besides that there were well qualified persons sent to each district to instruct the growers in the newest and most scientific modes of managing the crop. Various statistics have been published relative to the breadth of soil under flax culture in Ireland in former days, but it was not until the establishment of the Registrar-General's office that perfectly reliable returns were given to the public. After the famine year it was found that the entire growth of the island was only 53,860 acres—not more than one-third the quantity estimated twenty years before. We annex a table of the relative extent of flax land in each province at different periods:—

	1809.	1860.	1864.
	Acres.	Acres.	Acres.
Ulster .....	22,831	123,424	278,254
Leinster .....	4,217	1,280	7,383
Munster .....	1,677	1,666	7,620
Connaught .....	6,331	2,216	8,685
	35,056	128,545	301,942

Here we see that during the fifty-one years that had elapsed from 1809 to 1860; Ulster had extended the growth of flax more than five times, while in the other three lower provinces the culture had very greatly fallen off. In the course of the last few seasons societies were got up in each of those sections of Ireland for the encouragement of flax-growing, and some good arose out of the exertions thus made; still, considering the profits which may be realised from that crop as compared with either corn or potatoes, the progress made has not been equal to anticipation. And yet there are soils in the south of Ireland far superior to those of the north for the growth of the finer qualities of fibre. A small lot of flax raised last season in Down was sold at 18s. 6d. a stone, or at the rate of £148 a ton; and if in the bleaker and less fertile lands of that

county such a class of flax can be raised, what might not be done on the rich soils and milder atmosphere of Cork or Tipperary?

An Antrim farmer sold nearly two hundred stones of flax at an average of 8s. 6d. a stone, from the produce of a field about three and a half acres in extent. This was a rare case; still it proves what may done where special attention is paid to all the details of management. At a moderate calculation, and taking into the estimate the inferior as well as the high-cultivated soils, the turn-out of clean, marketable fibre for last year's flax-growth in Ireland may be set down at 63,000 tons, being about 3½ stones to the acre. The low rates for grain and the great demand for flax induced a great number of farmers, who had never before attempted it, to try their hands at flax culture, and as men don't generally become adepts in any art by mere intuition, many of those persons were disappointed with the results of the to them new department of enterprise. In numerous cases such growers were unacquainted not only with the mode of preparing the soil, but they knew little of the quality of seed to choose; and still more, they were quite ignorant of the system of steeping and grassing the flax-straw. Vast quantities of this article, grown under these circumstances, were so inferior that, in the midst of an active demand, and highly remunerative prices for medium and good flax, it was difficult to get the very inferior qualities sold at any price, and recent lots were disposed of at 2s. 6d. to 3s. a stone. The great majority of the Irish flax-growers—those who from long experience and superior skill have become very successful in that department of tillage—had a most prosperous season of it, the net profits of last year's growth ranging in most cases at from £10 to £15 the acre.

What may be the extent of flax culture in Ireland this year has yet to be seen. A decrease is certain as compared with the area of last season; but if many who failed in their first attempts to grow a crop which requires peculiar attention to details will not matter a second trial, numbers of others of the higher class schools of agriculture will increase the borders of their flax land, and thus, in at least some degree, the deficiency will be materially lessened. The experience of the last few years has taught the forward farmers of Ulster some excellent lessons, and one of them is the utter fallacy of the old cry that "flax is a most exhaustive crop." It is quite true that it requires soil in good condition to grow flax successfully, and that it does not leave any solid manure in return for what it carries away; but, independently of the refuse cast off in the process of finish, and which forms famous stuff for cattle feeding, the liquid left in the tanks in which the straw has been steeped contains the finest properties of manure, and if carefully preserved and rightly spread on the land it would fully restore all those elements of fertility extracted from flax fields by that crop.

The cultivation of this fibre by home growers has yet to be estimated at its real worth. Nearly nine millions of cash were paid in 1864 for the imports of foreign-raised flax and flax seed. How much of that enormous sum might have been distributed in this kingdom to enrich farmers and farm labourers if some attention had been paid to home cultivation!—Leeds Mercury.

## ODDS AND ENDS OF FARMING FACTS.

(54). Rye is stated to be a first-rate feeding material for dairy cows: it increases the flow of milk, and the cows thrive well upon it. One hundred parts of the grain contain 18.83 of flesh-forming, or nitrogenous substances, 61.14 of non-nitrogenous or heat-producing and respiratory compounds, 10.29 of fibre, 1.74 of inorganic or ash, with 13.0 of water. One hundred parts of ash contain of potash 22.08, of soda 11.12, of lime 4.93, of magnesia 10.35, of oxide of iron 1.36, of phosphoric acid 48.75, of sulphuric acid 98.0, of silica .43.

(55). Mr. Valentine's estimate of the cost of cultivating an acre of beans by his system, where the naked fallow is dispensed with, is as follows:—One ploughing in autumn 10s., one drilling in spring 2s. 6d., three harrowings 2s., one rolling, if necessary, 6d., one harrowing after the

plants are above the ground 6d., sometimes two harrowings 6d.; one horse-hoeing, say an average of seasons by the common hoe or plough, three acres per day, 1s. 8d. per acre; two hand-hoeings just beside the rows, 5s.; one more horse-hoeing, if necessary, 1s. 8d.; in all, 24s. per acre.

(56). So far as the formation of flesh is concerned by the use of oilcake, it has been estimated that 21lbs of poppy-cake are equal to 27lbs. of hemp-cake, and these are each equal to 23lbs. of rape-cake, or 22lbs. of linseed-cake, known as *par excellence* oil-cake.

(57). According to Johnston, while a Holderness cow gave 29 quarts, producing 1lb. of butter to the 12 quarts, an Ayrshire cow gave 20 quarts, and 1lb. of butter to the 9½ quarts; an Alderney cow gave 19 quarts, and yielded



1lb. of butter to the 12 quarts; a Devon cow gave 17 quarts, and butter at the rate of 1lb. to the 9½ quarts.

(58). Mr. Smith gives the following as a new and "possibly novel" five-field course of cropping: First year, turnips and grain crops; second year, rape and young seeds, without corn; third year, seeds, grazed or mown; fourth year, wheat; fifth year, barley. This course is suggested as a remedy for the evil which is to arise from the high farming of the four-course system, where, in consequence of forcing the roots to their utmost growth by artificial manures, the barley crop is poor in quality, and is easily lodged. By the new course recommended, the labour is reduced, the pasturage for sheep increased, a larger interval between the root crops is secured, the average value of the "seeds" nearly doubled, and, last of all, the barley crop is improved.

(59). The same authority gives the following mixture for making superphosphate, the quantities being calculated for an acre: 42lbs. or 1 bushel of bones, 17½lbs. of sulphuric acid, 9lbs. of water, and 10 bushels of ashes; the bones to be sprinkled with the water before the acid is employed.

(60). The grain of wheat is not made up of one part essentially the same throughout; on the contrary, it is made up of two different portions—(1) the bran or outer skin, and (2) the flour. The bran is made up of woody fibre and nitrogenized substances, allied to gluten; the flour, of gluten, starch, gum, and sugar.

(61). According to Professor Way, the following are the exhaustive rates of the three important cereals per acre: Taking the average yield of wheat at 80 bushels, and each bushel to weigh 61lbs., we find that at the rate of 1.67 per cent. the 1890lbs. contain 80lbs. of ash. Of 40 bushels of barley, at 48lbs. the bushel, with the rate of 2.20 per cent. of ash, equal to 42lbs. of ash are withdrawn from the soil by the 1,920lbs. produced. Of the 45 bushels of oats at 42lbs. the bushel, and at the rate of 2.60 per cent. of ash, there are 49lbs. of mineral matter. Taking these results as *data*, the mineral matter or ash of the above crops will be found to consist of the following substances: Phosphoric acid (1) wheat 18.5, (2) barley 13.4, (3) oats 10.6; magnesia (1), 3.6, (2) 8.0, (3) 4.8; potash and soda (1), 10.2, (2) 10.5, (3) 7.5; silica (1), 1.5, (2) 12.5, (3) 25.0.

(62) Calculations have been made to show the increase in weight of sheep when fed under certain circumstances and upon certain foods, from which it appears that when fed under cover a sheep will increase in weight at the rate of about 9lbs. per week for each 100lbs. of live weight. It takes to make 100lbs. of live weight 2½ cwt. of oil-cake, the same weight of corn or hay, and about 2 tons (or in some cases 1½ tons) of roots. It is to be noted that, as a rule, the cost of the food required to produce a certain degree of weight is more than the value of the weight, the difference being made up by the value of the manure. At the same time, also, it is to be remembered that the results named above are those under the shelter system of feeding.

(63) The number of sheep to feed down a crop of turnips, at 80 tons to the acre, has been thus stated:—"16 young and 8 old Leicester sheep, and 20 young and 10 old blackfaced sheep."

(64) The following are the live weights of the long-woolled breeds of sheep:—At two years old Leicesters weigh 120 to 150lbs.; Lincolns, at a year old, 80 to 100lbs.; Cotswolds, at two years, the same as the Leicesters; Romney Marsh, 120 to 140lbs.; Exmoor, 60 to 70lbs., at four or five years of age; Herdwickes, at the same age, weigh 40 to 50lbs.; Bampton, at two years, 120 to 150lbs.; Devonshire South Hams, at the same age, 100 to 120lbs.

(65) The weights of the fleece of the above are as fol-

lows:—Leicester, 7lbs.; Lincolnshire, lowland 10lbs., upland 8lbs.; Cotswolds, 7 to 8lbs.; Romney Marsh, 8lbs.; Exmoor, 4 to 5lbs.; Herdwickes, 8 to 4lbs.; Bampton, 7lbs.; Devonshire South Hams, 9lbs.; blackfaced Scotch, 8lbs.

(66) The following table shows the cost of digging drains of different sizes and in different soils:—

Feet.		Depth of drain.	
4	8½	4	18
12		Width of drain at top.	
7½	9½	14	2½
Average width of drain.		Running yards of the drain to the cubic yard.	
5	1.15th	0½	1
At 4d. per cubic yard.		At 6d. per cubic yard.	
Sandy soils, light loam, and light clay, classed as easy digging work.		Stiffer clay and gravel, classed as more difficult, requiring some pick-work.	
Yard.	Rod.	Yard.	Rod.
1 8-5lbs	0 9	2 2-5lbs	1 0½
1 8-13lbs	0 7	1 11-13lbs	0 10½
0 4½	1 1-5th	0 6½	1½
At 9d. per cubic yard.		Hard clay and close soil, classed as difficult, requiring pick-work.	
Yard.	Rod.	Yard.	Rod.
3 1-5th	1 5½	3 1-5th	1 5½
2 6-13lbs	1 2	2 6-13lbs	1 2
0 8½	1 2	0 8½	1 2

(67) The weight of a cubic yard of clay, in cwt., is 33.2; heavy loam, 31.2; medium loam, 30.1; light loam, 27.2; sand, 24.2; gravel, 23.1; chalk, 40.

(68) A cubic yard of farm-yard dung weighs one ton on the average if made in cattle boxes; if in the yard, it weighs a fourth less.

### A REMEDY FOR THE FLY.

SIR,—The flies are now severe upon the turnip crops in this beautiful district, and I expect, with the present distressingly hot weather, the young plants are sustaining the same punishment all over the kingdom. Pray let the farmers know that if they will only cause to be sprinkled *evenly* along the top of the drills a little *soot*, between 8 o'clock at night and 6 in the morning, their crops will be *quite safe* so far as the pest alluded to is concerned. Sometimes it will be necessary to repeat the operation, but this I did not often find requisite; and by adopting this application I never once failed in obtaining a good crop. The operation is a dirty one, not in usual labour hours; and I always allowed my people, both male and female, 3d. per hour while engaged in approaching the appearance of sweeps. Either myself or my bailiff was always present to watch that the soot was *evenly* spread, and not dropped down in little heaps.

Yours, obediently,

G. W. FOWLER.

Denbigh, North Wales, June 23rd, 1865.

## REPEAL OF THE MALT TAX. TO THE ELECTORS OF THE UNITED KINGDOM.

The Central Anti-Malt-tax Association earnestly request attention to the following statement: The Excise Duty charged upon barley during its conversion into malt is the only tax of any importance levied upon the raw produce of the British soil. This heavy tax, amounting to 70 per cent. upon the average price of barley, forbids the maltster from selecting any other than the finest quality for malting; and therefore seriously interferes with the use of the lower description of grain, which, if freed from this tax, would be to a large extent malted for feeding as well as for brewing purposes. The duty on malt is equivalent to double, and in many instances, to treble the annual value of the land upon which the barley is grown; and, consequently, in many districts capable of producing only the lower qualities of Barley, the cultivation of that crop has been so much discouraged as to be now almost entirely abandoned.

In 1750 the malt duty was only ... 4s. 0d. per qr.

In 1865 it had increased more than  
five-fold, viz., to ... 21s. 8d. per qr.

The continuance of a tax increased to five times its original amount, which has reduced the consumption of malt in proportion to the population at least one-half during the present century, and in the meantime to lower the duties upon all articles of foreign produce which come into competition with malt, thereby stimulating their use, is an act of gross injustice to the British farmer. To that numerous class of the community, the working men, whether in the town or in the country, the malt-tax is specially oppressive. Although to them wholesome beer is a most nutritious, invigorating, and an almost indispensable article of diet, yet to many it is known as a luxury which they can only occasionally command. By the repeal of the malt-duty the working man's beer might be reduced to nearly one-half of its present cost; and to retain undiminished this heavy tax, which so largely increases the price of the poor man's beverage, after having recently reduced the duties on, and thereby materially lowered the cost of, foreign wines and spirits—luxuries mainly consumed by the wealthier classes of society—is manifestly most impolitic and unjust. It is commonly asserted that the malt-tax cannot be repealed, because of the large sum it yields to the Exchequer; but it is a fact that the Government has, within these two years, reduced taxes equal in amount to the sum realized from the malt duty, without diminishing the revenues of the State. Those who promote the repeal of the malt-tax disavow any desire to impose additional taxation in order that the duty on malt should be taken off; but they strongly protest against the unfairness of the malt-tax being left untouched, whilst other taxes, which have been already previously reduced, continue to be still further diminished. The flourishing state of the national finances has been recently attributed by the Chancellor of the Exchequer to the removal of fetters and obstructions from the path of industry, and to the free scope now given for the development of the productive powers of the kingdom. We ask—"Why should not this enlightened policy be applied to malt as well as to wine, to cotton, to paper, and a host of other articles from which taxation has been removed?" The malt tax is equally injurious to consumers and producers; it is universally acknowledged to be entirely at variance with all recognized sound principles of taxation, and especially with the policy of free trade. For these reasons the Central Anti-Malt-tax Association feel fully justified in urging all persons interested in the question, not to vote for any candidate at the approaching election who is not prepared to support the movement in favour of the reduction and ultimate repeal of the malt tax.

On behalf of the Council of the Central Anti-Malt-tax Association  
(Signed), P. S. FURNETT, Chairman

Central Anti-Malt-tax Association, 18, Warwick-street, Charing Cross, London, June, 1865.

## THE WARRANTY FOR HORSES AND CATTLE.

JAMES C. BIRDSEY.

This was a case of considerable interest to sellers and purchasers of horses and cattle, tried in the Queen's Bench, Westminster, on Wednesday, June 21. It raised the question whether a person employed by a dealer to sell horses or cattle has authority to give a warranty. The plaintiff, who described himself as a farmer and cattle dealer at Leighton, in Bedfordshire, sent some cows up to the Islington Cattle-market for sale; and they were sold there by one White, a salesman, to the plaintiff, a cowkeeper, who bought them for the sake of their milk. According to the case for the plaintiff, the cows turned out to be diseased; and they infected the plaintiff's other cows, so that they died; and he sued on an alleged warranty by White that they were sound. This, however, White denied; and the unsoundness also was denied, so that there was contradictory evidence on both points. The learned judge (Mr. Justice Mellor), in his summing up, said (according to the note taken by the plaintiff's counsel): "As White was a dealer, he may be assumed to have had authority. The plaintiff must satisfy you, however, that the defendant, either directly or by his conduct, authorized him to warrant." The jury gave a general verdict for the defendant, negating the warranty or the breach of it, or both.

Mr. Serjeant Toser, for the plaintiff, now moved to set aside the verdict and for a new trial, on the ground of misdirection according to his note of the summing up. He urged that the latter part of the passage he cited from it was not consistent with the former part of the passage, which laid it down that the authority to warrant was to be presumed. That he insisted, was correct, as the owner was a dealer; and for that he cited "Story, on Agency," sec. 57: "A servant intrusted to sell a horse is clothed, by implication, with authority to give a warranty." So "Pitt Taylor, on Evidence," p. 526: "When the acts of an agent will bind his principal, then his admissions, statements, or representations respecting the subject matter also bind him, if made at the same time, and constitute part of the *res geste*."

The Lord Chief Justice cited from "Roscoe on Evidence," p. 333 (the last edition), a passage which ran thus: "A servant employed to sell a horse has an implied authority to warrant; and even where the servant has express directions not to warrant, and does warrant, the master is said to be bound, unless he has notified to the world that the general authority is circumscribed. But, according to the later authorities, this has been confined to sales by servants of horse dealers, who may be supposed to possess a general authority."

Mr. Justice Blackburn cited the case of "Brady v. Todd," 9, "Common Bench Reports" (N. S.), in which the Court of Common Pleas had decided that the servant of a private owner intrusted to sell and deliver a horse on a particular occasion is not by law authorised to bind his master by a warranty. That case seemed to apply here; and it would be very inconvenient if, in such cases, the servant had authority to bind his master by a warranty.

The Lord Chief Justice observed that it might, perhaps, be thought that it was still more inconvenient that the owner of a horse should be able to sell it by a servant not authorised to say if it was sound or unsound. The authorities, however, appeared to qualify the doctrine formerly laid down on the subject, so far as to bind this Court until they were reversed in a Court of Error. Those later authorities appeared to apply here, and to preclude the plaintiff from recovering on an implied warranty, as White was only his agent on the particular occasion; and therefore the present application must be refused; but then there would be leave to appeal, in order to carry the case, if desired, into a Court of Error.—Rule refused.

## AGRICULTURAL ECONOMY.

## THE VALUE OF STRAW AS FOOD AND MANURE.

The courteous letter in the *Mark Lane Express* of June 5, signed Arthur Talbot, forms a good text under which this subject may be further discussed. The question he has asked we repeat in full, that we may start fairly: it is, "Whether, in making the assertion that 'it is better to return three-fourths of the straw to the soil than gobble up a greater quantity direct with animals,' he has ever considered the point as to the possibility of straw passing through the animals and not losing its carbon and other fertilizing elements?"

The answer to this might be cut short by asking, Who has not considered this question? and adding, it is one that does not require the aid of chemistry to solve, for nine practical men out of ten would give a perfectly correct reply. But, by way of discussing the matter, for the purpose of following it with a few general remarks, it may be asked, What would be the use of cutting straw into chaff, and steaming it to make it readily digestible, if it afterwards passed through the animals without serving any purpose in the economy of nature, such as supporting respiration, and thereby generating heat, supplying growing organs, if the animals be young, and repairing the ordinary waste which in all animals is continually going on? An animal, which is a living machine, is not like an inanimate bit of mechanism, as a breech-loader, which may be charged with powder and ball at one end, and have these shot out at the other, without being better or worse, as regards condition, size, and weight. If straw be the material given to an animal, and this be the only food—and there have been thousands of animals so kept from time to time in the months of winter—the carbon of the straw must be the source of the heat which preserves the animal's vitality; and as this generation of heat is induced in the lungs, and the carbonic acid so formed is given off subsequently, the carbon of the straw is again returned to the air, and it cannot therefore again re-enter vegetable production until it has been re-collected by the leaves of vital vegetation. Whatever small quantities of phosphates and nitrogenous compounds there may be—and if there were not, some present practical chemists could not say straw was good food—these go to, or are appropriated in, the formation of bone and muscle, and are therefore retained in the animal, instead of being returned to the soil for increasing vegetation, as they would have done had the straw been returned to the soil direct. This is simply a detail of the reasoning which every practical man of ordinary judgment employs when he argues the difference between the result to the farm where store animals are kept and fattening animals are fed.

We have put an extreme case that we might be explicit, for the same reasoning may be applied, or modified, according as animals may be fed on much or little straw, as an admixture with watery carbonaceous green food, as turnips and tares, or more concentrated food, such as corn and linseed. We have seen cows and full-sized store cattle kept in sleek trim through the winter months on four or six pounds of cake and corn meal, and in these cases your correspondent's views would probably be realised, that is, if enough other nutrition, according to the size of the animals, was given. But here the fact of the straw not being reduced in value, from not yielding its constituents and being assimilated in the animal system, would be due to the other food, which is not the point at issue. If straw be worth 37s. a ton as food, it is because it will yield so many pounds of meat, worth so much money, or form so much size of bone or frame as would be of equal increased value for putting meat upon. There is no reliable proof or sound pretence for holding that either one or the other results would follow such practice. But to put this ton of straw in a properly reduced form as food to a given quantity of vital vegetation—as beans, clover, tares, turnips, rape or grass—then there will be an increase of bone-forming and meat-forming food that not only will enlarge the animals that eat it, but, when so eaten, admit of something being passed off to reduce a greater quantity of straw, and further enrich the farm, instead of its being impoverished more and more yearly, as must be

the case where the corn and meat produced are sold off, and the straw is at the same time used as an auxiliary in this animal production. In this, of course, we adhere to the position we started from, viz., to land of middling quality, as regards yielding straw, and that which is poor in this respect from being deficient of carbon.

If this plain, simple, and more natural practice were pursued, see the expenses that would be saved, as well as the increased return of meat that would ensue! In the first place, if the straw of the coming harvest be made, as far as practicable, into manure in the autumn, and applied judiciously to the crops to be grown next spring, a heavy interest will be returned for the investment, for "its carbon and other fertilizing elements" will not have been appropriated and sold off the farm, but will reappear to go into the sheep-troughs, or come back to the fold-yard abundantly increased, and in so digestible and wholesome a form that the expense of steaming would not only not be required, but to adopt it would positively be injurious to the food. If acidulous and saccharine vegetable food be steamed, its previous assimilable character would be largely detracted from, and purging be induced in the animal, where otherwise—that is, had it been given in a natural, or raw, state—it would have produced thriftiness, sleekness, and fat. In this reasoning we do not refer to young and watery tares and clover, such as no practical man would use, except from necessity, but to the sound, well-grown feed of fields and pastures. Rooks, when steamed, act, in ruminating animals, horses and pigs, as an "emulsion" as the veterinarians term their mixtures of gum and gruel. We have frequently seen folks get into this dilemma when they have had steaming apparatus in use. The order then given would be to increase the straw and, it may be, meal too, till the desired effect ensues. This having been done, a settled theory is at once formed on "the great value of straw as food!" But these cases do not prove the value of straw as a bone and flesh-forming substance, but simply that the theoretical discoverer had either read and been guided by a misapplication of simple elementary scientific data, or that he himself had, under the influence of a castle-building-in-the-air enthusiasm, construed these elementary truths according to his own love of novelty or desire to be different, if not superior, to the ordinary run of common-sense people.

These points being so perfectly clear, we have no hesitation in saying that we are—taking the whole country as it is—producing a far less amount of animal food than we might have done had not so many erroneous and unprofitable theories been written and talked into popularity or favour. We have Liebig always telling us we are running to a condition of vegetable bankruptcy because we do not take back the sewage of towns. Then we have men on the same side who are "great" in the art of taking more off farms directly, by the way they argue that straw is of great value as food. Thus, two or more doctors on the same side are driving their theories to directly opposite points. Can both be right? Then we have the opposition, who say that these losses can be restored by such artificial means as using superphosphates, guano, and other extraneous fertilizers. But, if the whole country be taken into consideration, where are the raw materials for supplying this exhaustion to be found? The main material we have to depend on is the refuse of our corn crops, viz., straw. Are there no such things as poor pastures in the country? If not, there would be no need for reading papers before farmers' clubs on the best way of enriching them. Will rotten straw enrich them? Let it be tried, if folks are so confident in their theories that they believe it will not. Which, too, is the most valuable—increased crops of hay and green food, neither of which requires steaming, or all the attendant expenses of straw chaff (steamed), to rectify the bungling above referred to?

The main inference to be drawn from all this seems to be, that theoretical men misapprehend the natural resources at

their command, and then resort to all sorts of fanciful appliances to make up for their want of judgment. These views are often more than a matter of inference: if not so, how is it that gentlemen farmers, as they are termed, who have an abundance of capital to use, almost invariably make no profit at all, and often lose, in addition, as much money as their farm would let for to a practical tenant, who would pay his rent and make a profit on his capital too? "Ah!" it will probably be here exclaimed, "gentlemen don't manage well." Just so; and this is the point for which we are contending. But this mismanagement consists in their following the bent of fancies, and being beguiled into expenses that, as part of an agricultural business, can never afford any commercial profit.

Will Mr. Arthur Talbot assure us that his farming pays? He says: "All the [his own] straw is chopped up, and but little put under the animals; consequently, I have been able to keep on a small holding as much stock as my neighbours do who hold twice the quantity of land I do. My crops are generally too luxuriant. This seems to militate against 'W. W. G.'s argument." The latter conclusion is certainly not accurate; for we have not before us the natural character of the farm, nor the other conditions which may relate to the quantity of corn used as food for stock, or the extraneous fertilizers applied. If our friend can assure us that his farm is of middling, or an average quality, that it has been ordinarily cropped for several years, and all the corn has been sold off, and that now, after chopping and steaming all the straw for stock to eat, the "crops are generally too luxuriant," then we shall admit that our conclusions are open to doubt. But if this were the case, where would Liebig be? And what is the use of all the bother which has been going on for years, and now seems to be as far as ever from being ended? All we have contended for, and, in the public and agricultural interests, wish to prove is, that as soils *do* become exhausted by growing corn and supplying the wants of a population, and that, as animals, if kept on the ordinary food of the farm, tend to exhaust it as much as does corn, if the fertility of a farm under close cropping and stocking would be preserved, something must be returned to it to excite vegetable growth, and develop (by dissolving) its mineral compounds. We are satisfactorily assured, and we hope that we have in a great measure made it plain, that, under the ordinary present condition of British farms, it is a species of suicidal or uncommercial policy to go to any great expense in preparing straw, and then sell it off in the form of animal substances almost as directly as though it had been sent to market in the truss.

The other point Mr. Talbot raises, about "what takes place in the neighbourhood of London, where the practice of milk-sellers is pretty nearly similar to my own," does not bear more on the point. Do the 100 cows referred to live entirely on the food grown on the farm named? We are also familiar with several farms under similar treatment, and there would not be the slightest difficulty in fully accounting for their increased and increasing fertility. Not one particle of this, however, can be attributed to the straw grown being cut into chaff and eaten by the cows. This practice is followed for the good of the cows' health, and as some means of support; and what is thus appropriated is doubly replaced by bought food, as grains, offal, cakes, and corn; or some arable land may be attached, and this may be kept almost altogether under root and other green crops, or carbon-collecting cultivation. Another point occurs near London that may have been overlooked by Mr. T., viz., the immense increase of population, and the consequent consumption of fuel, &c., in London, has had a vast influence on the land and pastures within 15 or 20 miles; and the more so according to the direction in which the wind more frequently sets. So great is this continuous dressing, that close upon the borders of some of the outskirts vegetation has become rank and comparatively valueless; but everywhere a few miles out, where sheep get discoloured, there there is an almost constant supply of carbon in the form of soot; and not only is this so, but London smoke, that is, fine soot, is highly charged with ammonia and other fertilizing elements dissipated during the immense amount of frying and grilling that daily goes on in this enormous metropolis. The farm mentioned by Mr. T. may be within these influences, or it may not. We have endeavoured to argue the question on its merits, and our conclusions would be the same. And if Mr. T. further inquire into the practical working of the farm he alludes to, we have no doubt but that he will come to a reasonable conclusion as to the causes for its increased fertility; and we are confident he will not attribute any of this favourable change to the fact of the straw used on it being principally *eaten up* by cows.

The celebrated Daniel O'Connell used to say he could drive a coach and four horses through any Act of Parliament. The position in which we now want to see many amateur farmers and lovers of farming, as well as practical men, is that of being able to perform the great feat of driving flocks of sheep and herds and yards of cattle through the "scientific wuddle" which has of late years done so much mischief to the agriculture of this country. If the price of meat, butter, and cheese be any guide, the consuming public would also be delighted to see this feat performed.

W. W. G.

## FOREIGN AGRICULTURAL GOSSIP.

The position of agriculture is considered to have slightly improved in France. Intelligence collected as to the state of the crops shows, however, that sufferings have still to be supported by many farmers whose depression will be rendered excessive by the failure of success in colza, flax, forage, &c. In many localities, too, cereals present very little straw, and but short ears. The vines, however, promise to more than repay the cultivator for his pains. Steps have been taken by the French Government in order that small agriculturists may profit from the reduction in the price of guano. Hitherto the agents for the Peruvian Government in the matter of guano, have caused £1 per ton more to be paid for it when it is purchased in quantities below 10 tons. The French Government has, however, addressed "reclamations" on the subject to the cabinet of Lima; and in consequence of this intervention, the Minister of Peru at Paris has just addressed to the merchants charged with the sale of this manure in the empire instructions to the effect that they must sell the guano at £12 8s. per ton, whatever may be the quantity applied for. This measure is expected to involve a fall in the manures sold by small quantities, as it must be imitated by the manure trade generally. The struggle for the "prizes of honour" established by the Government for the best agricultural workings in a district is so keen that it is sometimes very difficult to say which is the best, while the regulations require absolutely only a single triumph. There often result in consequence serious discon-

tents and discouragements, although this is an inconvenience which might be avoided by the creation of a second prize. In the department of the Landes the prize has just been carried off by M. de Dampierre, and his competitor M. Manrique declared, after the decision of the jury, that he wished henceforth to abandon the culture of the soil, since his efforts had not been sufficiently recognised. This is a thoroughly French, and we must add a thoroughly regrettable incident. We announced recently that the Agricultural Society of the Pas-de-Calais had decided on the foundation of a genealogical register or herd-book for the Flemish breed of cattle. This herd-book has just been added to that commenced some years since by the central administration for the Durham breed, and to that established for the Charolaise breed. By a decision of April 20, 1865, the Minister of Agriculture approved the regulations of the Flemish herd-book, which is to be established at Arras, under the patronage and inspection of the Central Agricultural Society of the Pas-de-Calais, whether the animals indicated exist in the department of the Pas-de-Calais, or whether they are met with in any other department in the north of France. A special committee, composed of five members of the Central Agricultural Society of the Pas-de-Calais, will be charged with the editorship of this genealogical register. The committee will pronounce in the last resort upon all difficulties which may present themselves. Breeders must enter male animals before they attain the age of four years, and females before they are

eight years old, and they must send before Oct 1 and Dec. 1 in each year a recapitulative statement of births since the publication of the preceding *fascicule* of the register, the deaths which have occurred during the year, the names and addresses of purchasers, &c., as well as the names and numbers of the animals which have ceased to be devoted to reproductive purposes. A sum of 4s. will be charged for the inscription of each animal in the register, and must accompany the application for inscription. The register will be published annually, and will be sent gratuitously to the owner of each animal inscribed, to all agricultural societies or committees of the district of the north of France, and finally to all French or agricultural societies applying for it. Various other arrangements, into which it is not necessary to enter, are also prescribed by the painstaking minister. The imperial commission of the Universal Exhibition of 1867, which comprised only representatives of the State and the city of Paris, has added to its numbers from the subscribers to the guarantee fund 19 representatives of industry and agriculture. By this adjunction industry has obtained two representatives, M. Dailly, a member of the great culture section of the Central Society of Agriculture, and M. Cherandier de Valdrôme, of the section of sylviculture. The sale of agricultural implements is constantly increasing in France. In the establishment of M. Damey, at Dôle, in the Jura, the sales now amount to £20,000 per annum, and no less satisfactory results are indicated as regards the house of Albaret, the old house of Duvoir. Another less old-established concern, that of MM. Heylandt and Sitter, of Colmar, which only sold in 1854 machinery to the value of £120 to £160, now makes sales exceeding in value £4,000 annually. M. Pinet, jun., of Abilly, in the Indre-et-Loire, reports that up to 1863, the production of works had to be constantly increased to meet the demand, but last year there was a falling off of 25 per cent., and even where sales were effected payments were made with more difficulty, which the sagacious M. Pinet attributes to the low price of agricultural products. Even as it is, however, M. Pinet is an employer of 250 persons. It is evident enough that French agriculture has entered in the most complete manner upon a progressive course, upon which it will continue to advance if unfavourable circumstances do not check its further development.

We proceed to give a few details with reference to the district state agricultural exhibition of the Mans. The district of the centre of France is accustomed to brilliant agricultural "solemnities," but the district show which has just taken place at the Mans equalled, if indeed it did not in some respects exceed the shows which preceded it at Tours, Poitiers, and Nevers. The bovine race was represented at the show by 314 animals, divided in the following manner between the various categories indicated by the programme:—Parthenaise and Nantaise (Vendean), 34; Charolaise, 74; various French breeds, 71; Durhams, 40; miscellaneous French

breeds, 10; Durham crossings, 60; miscellaneous crossings, 25; total, 314. The category of Vendean races was composed almost exclusively of Parthenais animals, known under the name of Choletais by the Parisian butcher's trade. It was very well represented, especially in the sections of subjects upwards of three years of age. This excellent race, which to the good quality of its meat unites a remarkable aptitude for labour, seems to have been making progress of late, as it almost shared with the Charolaise the honours of the exhibition, and the jury easily found opportunities for awarding the fifteen prizes offered by the programme. The bulls of M. Mathieu and M. de la Massardière, which obtained the first and second prizes in the second section, were especially perfect in respect to their conformation; in the young animals, those of M. Branthôme, sen., were remarked in the first rank. The Charolaise race perfectly maintained its reputation at the show. All the animals of this breed which were exhibited were good without exception; although it must again be said that many subjects were in too exaggerated a state of fatness to be good reproducers. After making this remark, we must only give prizes to the products of several breeders of the Nièvre and the Cher—at the head of whom may be placed as usual the Comte de Bouillé, M. Benoist d'Azy, M. Signoret, M. Doury, M. Suif, and M. Bellard. In the midst of the curious mixture presented in the category of miscellaneous French breeds, the Cotentin race distinguished itself, both in respect to numbers and quality. A fine young bull of M. Bary, sen., of La Ferté-Bernard, obtained the first prize of the first section. The Mancelle race, although it may be said to have been at home, did not shine particularly; and, without the two prize cows of M.M. Courtillier and Vétel, it might almost have been supposed that the type of the country only existed in the regions of imagination. The Durham race did not present a very numerous contingent, but it comprised some superb beasts. The section of old bulls was especially imposing; and, although the decisions of the jury were discussed with much warmth by "special"—or, in plain English, practical—men, justice was not the less rendered to the animals of M.M. Rivrain and Jachard, which obtained the first and second prizes. In the section of heifers, M. Tiersonnier won with a charming little beast, twenty-three months old; in the other sections, we still find among the laureates M.M. Salvat, Jachard, de Laage, &c. Dutch animals carried off almost all the prizes of the category of miscellaneous foreign breeds, in which for 12 rewards offered by the programme there were ten beasts exhibited. If the pure Mancelle race appears to have almost disappeared, it may be said that it lives again in its crossings with Durhams; it is, in fact, one of the French breeds which lends itself the best to this mixture. We have run out our allotted space, and must suspend for the nonce our notice of the phases of the exhibition of the Mans.

## HOW TO MAKE A GOOD STOCK OF POULTRY.

In hastening to be rich, by whatever means a man may choose, there is no less danger than folly; and the chief cause of a young poultry-fancier's failures is unmistakably his inconsiderate hurry in putting on his first stock. And as all first loves are naturally headstrong, so with this stock-farmer, unluckily, it is very often fruitless to reason. If you insinuate anything at all derogatory to the "blood" of his hen, he will exclaim—"What, she is from Mr. ———'s strain, which you need not be told, is second to none in the country." Do not, pray, imagine you can persuade such a gentleman. The hen is his, he likes her, and do not be so unkind as to hint that such a hen has not all the gifts and graces of the famous family whence she sprung. This is a specimen out of not a few people we have met with both in the upper and lower classes of society. Perhaps the best way to indoctrinate these persons into a correct estimate of their own fowls is skilfully to inform them of the superior standard of excellence the same breed have reached in other yards. There are others, again, whose stock you may criticise with freedom. Several faults will be conceded at once; but, being good-natured persons, they seem quite contented with one or two saving qualities, which in their eyes cover all infirmities. If the cock-bird be not very highly bred, he is a fine sprightly fellow, and very kind to his hens. If the hens are very small indeed for

samples of a large marketable fowl, and so most likely to become mothers of puny chicks, it matters little if they only lay well. On the other hand, poor layers are not to be banished, because they are perhaps fine "sow" queans, just a pleasure to look at." Now, to such of our readers as may have acted in this way, a word of exhortation or friendly admonition must be offered. Why, we ask, are you so indifferent about making your poultry pay, as well as afford you far more satisfaction than you can by any possibility have with such notions? Large chickens and large eggs, plentifully supplied, are perfectly compatible. We are aware that where the accommodation and means of rearing chickens are limited, eggs pay best, and Spanish are certainly the fowls to keep; but one cross, say with the Dorking, does not much diminish the size of the egg, while any chickens for sale would be much sooner ready and bring a better price. For this purpose, do not buy in any Dorking simply because he has got the distinctive marks of his class, but seek for a large-boned fleshy bird of mature age, at least not under nine or ten months old; if in his second year all the better. In like manner, let the owner of a stock of comparatively large fowls, while not forgetful of size, mix the blood with some breed more profitable as egg-producers. When a particular fowl, and still better, when a male and female have been proved

by experiment to give the right kind of progeny, be sure not to lose sight of the valuable discovery, and make hay while the sun shines by taking all you can get from them. This advice is, however, merely general, and the exhibitor must look much more sharply about him than the man who looks chiefly to the useful.

To exhibitors then we say, make yourselves masters of the points of excellence requisite for successful competition, or consult a thorough judge. If you have nothing in your yard close upon the standard of merit, cease at once to propagate therefrom, and buy from some one whose success has been marked and well sustained, and whose prize fowls are known to be mostly of his own rearing. This last condition is indispensable, for without it there is nothing in the name of prize-winner. Buy birds, if possible, that have won as adults. Mere early hatching may force success on chickens, at an autumn show, whose first victory is destined to be their last. Plenty of such precocious heroes may be found on the auctioneer's list or in the advertising columns of our newspapers; but, as you value the substantial qualities of your yards, pay no manner of regard to the glory of a first campaign, and minutely examine the dimensions of the conquerors, which you will find somewhat small, and in most cases even slender. To last, purchase birds bred in March or April, and earlier, especially if they are wanted for breeding as well as exhibiting.

When prize fowls are bought, they may just as well be lifted from the exhibition pen, for mistakes as to identity are sometimes made, very conveniently for the seller, but very provokingly for the unfortunate purchaser. Prize fowls in some instances are not the surest parents of a lucky progeny, yet they are generally; and purchasing them is a better and shorter way to a right stock than hatching, which is naturally liable to numerous hitches and much delay. The latter method, however, is preferred by all who wish to make their own stock (to whose number we are proud to belong), and is forced, through lightness of purse, on our humbler exhibitors, many of whom are among our best judges and most successful competitors, particularly in the more ornamental classes.

To all more or less inexperienced chicken-rearers, then, a few practical suggestions on hatching should be at this season far from inappropriate. As regards eggs, after an experience of twenty years, we confess our utter inability to tell what sort of egg contains a cock or hen chicken, and, after comparing notes with the most intelligent and trustworthy breeders, we believe no mark or shape of egg can determine the much-desired information. For fortunate hatching, nevertheless, the eggs must be picked. A thin-shelled egg is all but certain to be broken, and so spoil a whole nest. An unusually long egg, if of ordinary thickness or a little more, has in all probability a double yolk, and will produce, in most cases, nothing, and, if anything, a monster probably. A shorter egg than usual is also to be discarded, and so should one laid upwards of ten or twelve days, if strong lively young are wanted. Eggs one month old will hatch, but the produce are nearly always of feeble constitution. The shape will depend much on the particular breed; but compared with the standard of its own class, the oval neither too long nor too short is best for hatching. There is no need, as some have supposed, of turning those preserved for this purpose every day. But in cold weather gather them from the nests twice or even thrice a day, and do not expose them to the air when gathered, and store them with the narrow end downwards.

Put thirteen average-sized eggs, never more, under a hen of good size. Before the month of March, or when the eggs are rather large, or the hen small, eleven will be sufficient. The clucker cannot be too tame or too healthy. If she had liberty she would leave her nest regularly, and at an early hour; but being often confined and set in a dark place, let her leave her nest every morning, and, when necessary, lift her from it to feed where she cannot see it, and this at or about the same hour every day. To satisfy some tastes the nest should be of turf, with straw or hay above it; but again and again we have had splendid clutches, both for number and health, when the hen sat on nothing but plenty of straw or hay in a wooden box. Nevertheless, where a turf can be had, or the nest made on soft soil, all the better. Set two hens at the same time, and, if not numerous, the chickens can be put under one mother; but to ensure good clutches, let no attention be wanting. As the hatching proceeds remove the shells, and, to prevent the hen treading her young to death, keep her away from molestation. Clear the hatching-house, or box, from everything that might lead to hurtful accidents till the chickens can make good use of wings and legs. Indeed, from the first day of incubation, the place should be shut to all other fowls, lest additional eggs be laid by the intruders, so that having too many, the poor clucker, however anxious, will fail to bring out one bird. The worst annoyance, perhaps, that could happen to an inexperienced breeder is caused by a whole nest of added eggs, which were known to be good, and put under a tried hen. This may happen from some unknown condition of the hen's health, or from exposure to frost while she is allowed to be too long off the nest to feed, or from different hens set in the same place changing nests with one

another. Putting a warm flannel over the eggs in the absence of the hen is a safe precaution, and will accelerate the hatching by one day; while, to prevent the interchanging of nests, each should have a sliding door, and the hens be seen to enter their own; else, where their temperature is not equal, the eggs will all but certainly become added. Twenty minutes should suffice, in spring, both to feed, drink, and use the dust bath. If the hen seeks her nest, even in ten minutes, let her have it. She will just eat more heartily next morning. As the clucker now-a-days has seldom the choice of her own nest, and is often taken to a strange place, it need scarcely be added that the ready-made seat must be lined with soft, well-broken straw or meadow hay, and the stranger occupant should be shut into it on a worthless egg or two till she give evidence of close sitting. In ordinary years, walking according to these instructions, you will have fair success. If you do not succeed, then depend upon it your stock birds are at fault; or if the eggs have been purchased, you have got a lesson to deal only with respectable breeders, and even with them to bargain for not merely eggs from their best fowls, but for as newly laid ones as possible. If you mean to exhibit the produce of your own yard, you must breed extensively, for a great many others do this; and to keep abreast of them, your future stock must consist only of your very best young. How to rear these for such an end will form a fitting subject for some plain advice on an early opportunity. Meanwhile, to all our brethren of the poultry fancy we say, with best wishes for their success, go and wait faithfully on your hatching operations so long as April (one of the very best breeding months) lasts; but in doing so, let zeal be tempered with knowledge, and in the name of humanity do not rudely shake the eggs immediately before birth, or even throughout the period of incubation, unless you court the compunctions of conscience which belongs to one who commits murder by mistake. Let all obstetric help be tender, and obedient to nature's laws.—*Scottish Farmer.*

### WILD FLOWERS AT SUNSET.

As the bright red sun went down last night,

With my flowers a vigil I kept,  
Their starry blossoms of blue and white  
Were lovingly turned to the western light,  
Till gently they drooped and slept.

The daisy was first to bid adieu

To the light of the glorious sun;  
He had watched his journey the whole day through,  
His golden eye had been fondly true  
To his course, till the day was done.

The shamrock, sacred in days of yore,  
Was folding his triple leaf,  
The leaf so widely outspread before;  
And the violet bent to the mossy floor,  
Like a child subdued with grief.

At rest were the wind flowers, fair and shy,  
And at rest was the cowslip bell;  
And darker and darker grew the sky,  
Till closely sealed was the glowing eye  
Of the light-loving pimpernel.

The strawberry blossom bowed his head,  
And nestled his leaves between,  
Or crept away to a mossy bed;  
And the wood-sorrel drooped on its stem so red,  
And folded its trefoil green.

The primroses paler and paler grew,  
The celandine shone no more;  
A parting glance the forget-me-not threw,  
As it closed the pensive eye of blue  
That beamed with love before.

At last the world seemed all at rest,  
The glorious sun was shaded;  
Though a cloudy mountain bound the west,  
No fire glowed from his lofty crest,  
To mark where his light had faded.

And darkness reigned till moonbeams fair  
Fell on each sweet wild flower,  
And brightened the dews that were gathering there,  
On the buds and the blossoms, and everywhere,  
Like the drop of a summer shower.

—Poems, by Eliza Rogers.

## OPENING OF THE SALISBURY HOTEL, FLEET STREET.

The increased hotel accommodation required in the metropolis, now that our net-work of railways has accustomed men of business and country families to pay more frequent or longer periodical visits to this great centre of attraction, has been sensibly felt for some time past, and with an enterprise which does credit to their spirit and judgment, a few of the older members of the London Farmers' Club, who knew the wants of their friends as well as their own desires, resolved to remedy this objection, by building such a hotel as should be suitable to their modern requirements. The site chosen for this purpose was either a lucky wind-fall or a very happy negotiation. Salisbury-square was the only available place left in this over-crowded and business-beridden city which combined the advantages of being light and free from the rattle and hum of traffic, at the same time that it is within a few steps of an old main artery and but little farther from a greater new one—the Thames embankment, now being formed. The central situation of this site too, being as it is about half way between and in a line with the great city business offices, markets, marts, and institutions, and the Houses of Parliament, the Government offices, and the fashionable places of public resort and amusement, gives it additional advantages as a temporary town domicile for country visitors, who, as a matter of course, and very properly, combine a little lionizing and amusement with business; or, rather, do their business first, and then enjoy themselves at the theatre or concert, or as tastes may run, afterwards.

We have it on the authority of licensed victuallers—who ought to be good judges, and who know the opinions of "the trade"—that this Salisbury Hotel is in the very best situation in London for accommodating the middle-classes, for which it was built; for apart from its being, as they say, "handy to almost everywhere," it is quiet and retired for being "set down at," to sleep in during a stay, and for being "taken up from" on departing. These are points which cannot be avoided or overcome in a thronged street, and they are of great consideration to many visitors to town, whose nerves are more accustomed to clear country roads than to the rush of Hansom cabs, the close-shaving of omnibuses and the lumbering railway vans. Londoners may become unconsciously and unenviably insensible to the present irritating streets of the metropolis; and residents in the leading thoroughfares might imitate the miller when his water-wheel stopped and his house ceased to shake, by jumping out of bed in a fright, if street noises were to suddenly cease. But when country folks come to town to endure its bustle and noise, in addition, it may be, to serious business and more pleasant excitements, they do not want to have a course of training by night, that their tympanum may be easy and their brain sleep the sound sleep which refreshes, in the midst of loud and discordant sounds. These drawbacks to the pleasures of a visit to London are positive afflictions, in many situations, to most temperaments; but the patrons of the Salisbury Hotel may retire to rest in the full assurance that, although they are in the midst of this ever-restless metropolis, they will be free from the disturbances from which they have often before suffered and many others will elsewhere have to endure.

The hotel itself forms the entire south side of Salisbury-square, and its architectural character is at once striking for its correct mathematical lines and substantial and comfortable-looking features. No gaudy gilt-gingerbread effect has been attempted; but while a becoming taste and judgment have been exercised to produce a creditable modern building, the shareholders' capital has been prudently and wisely husbanded. The interior possesses every requisite comfort that the most particular visitor can desire. Light and air, two great essentials, are everywhere well distributed by the loftiness of the rooms and the depth of the windows. On the ground floor there is a lofty coffee-room 50 feet long by 25 feet wide; while in the west wing the Farmers' Club have three rooms, the largest being nearly 40 feet long by 20 feet wide, and from which are easily reached a coffee-room, a library and

smoking room. The ordinary bar, managers', and servants' rooms are as conveniently arranged in communication with the entrance hall. On this floor there is also a large room or hall for public meetings, discussions, and dinners. The size of this hall is 70 feet by 30, and 20 feet in height: it is lighted with a powerful sun-light, and is well adapted for hotel purposes during the pressure of such times as Smithfield Club Show weeks and other similarly attractive meetings, and for letting out to companies, deputations, and conferences, or any object which may call citizens together, or require countrymen to meet for some common interest in London.

On the upper floors there are several suites of large sitting-rooms, bed-rooms, and dressing-rooms in communication; private dining and sitting-rooms; and an excellently arranged coffee-room for ladies who may prefer more society and the lesser charges which belong to this more sociable department. The bed-rooms altogether are nearly 100 in number.

The basement is partly divided into extensive kitchens and the requisite accompanying offices, the fish, meat, and other larders being lined throughout with white glazed tiles, which give them a very cool, as well as clean, appearance. The remainder is bricked off into convenient divisions as ale stores and spirit and wine cellars; and, from their ample size and well-filled floors and shelves, there is evidently great confidence in the future consumption, and in which confidence we fully share. In the front of the basement is the butler's pantry, which contains a large stock of plate in the form of dishes, spoons, tea and coffee pots, urns, ale tankards, candelabra, &c., &c., all of which have been specially manufactured for the Hotel by Messrs. Dixon, of Sheffield. Beneath this is a sub-basement, containing cellars in connection with a tap, and other offices, the entrance to which is in a side street, and which are intended to be let off.

The minor arrangements, such as lifts or hoists for luggage, and dinners, baths, and other modern appliances, which we need not fully detail, are of the most practical and useful, as well as comely and elegant order, as the case may be. In fact all the arrangements of the interior are of the most excellent kind, and this simply from the object kept in view by the authorities of the Company and the designer and builder having been solid comfort within, in preference to anything beyond a substantial and imposing front and exterior. The cheerful aspect of the entrance, sustained as it is by the corridor and staircase running round the centre to the glass dome, cannot fail to please and gratify the well-to-do classes for whom this Hotel has been designed and completed.

The architect is Mr. John Giles, of Craven-street, who also designed the Langham, Richmond Hill, and other hotels. The builders are the well-known firm, Messrs. Trollope and Sons, of Parliament-street. The kitchens were fitted by Messrs. Adams, of the Haymarket.

Invitations for a private inspection were issued for Friday last, when about 30 gentlemen of the press and other professions assembled, and after passing through the various departments and noting some of the leading objects of interest, a halt was come to for discussing the merits of the establishment over a luncheon table, where specimens of the viands, *liqueurs*, wines, and the manner of serving them, were displayed; and if these were—as we feel assured they were—fair specimens of the resources of the Salisbury Hotel, we have no doubt about its rapidly growing into favour and rising to a high order of prosperity. The manager, Mr. Higgs, comes from the Euston-square Hotel, where he has had ample experience to make him in every way equal to this new enterprise. When these important points are kept in view, and it is farther considered that, notwithstanding some side-hill building difficulties, the cost of the Salisbury Hotel has been one-fifth less than the most economical hotel in London, and not more than half that of some which have paid good dividends, there is no doubt but that it is opened with the fairest prospects of proving to be a great commercial success.



## THE BATH AND WEST OF ENGLAND SOCIETY.

## MEETING AT HEREFORD.

The old West of England Society went to the very verge of its territory in selecting Hereford as the place of meeting for the present year. There were, however, no doubt, many reasons for the choice, as prominent amongst these the visit would promise, at least in some degree, to make amends for the disappointment experienced when Worcester was preferred by "the Royal." In fact, the occasion was seized on by the local authorities as a stick to beat you with, as to evince to those who had slighted the claims of the city the egregious mistake they had committed in passing over so advantageous a site. In so many words, the West of England Show at Hereford was to rival the All-England Meeting at Worcester, and some very commendable ambition was exhibited in the endeavour to achieve such a result. But this sanguine expectation was hardly realized. In many of the classes the array of stock, either for numbers or merits, was not up to an average, and the really grand entry of Hereford cattle was, when all is said and done, the great saving clause of the catalogue. Never, perhaps, has there been a finer collection of any particular breed, pointed as the section proper was by the competition for the local premiums, where we should be inclined to set the strength of the show. In the Bull, Cow, and Offspring lots—a favourite plan in these parts of proving a prize animal—Mr. Baldwin acted on the advice we gave him last autumn, and mated Battersea with his Duchess of Bedford, and the hope of the family, as centred so far in a sweet heifer calf. This renowned bull is still wearing well, without evincing any of those too frequent symptoms of public life, an ungainly over-done frame, a hard harsh touch, and a bare back. On the contrary, Battersea handles kindly enough; while the Duchess, more furnished and dropping to her leg, has grown into a nice square cow, as in every way a worthy partner to her distinguished consort. There were only three more of these family parties, and the Luddington herd had consequently a somewhat easy victory. But amongst the young things there was far more competition, and the pairs of heifer calves as they were led round the ring was certainly the finest proof of any breed we ever witnessed. There were fifteen entries, or thirty animals in all, supplied by such well-known Hereford men as Mr. Archer Clive, Mr. Boughton Knight, Mr. Roberts of Irvington Bury, Mr. Turner of The Leen, Mr. Taylor of Showle, Mr. Duckham, Mr. James of Mappowder, Mr. Davies of Yarpole, and Mr. Stallard of Brockhampton. With their beautiful rich kindly coats, their really pretty feminine heads, light necks, and already deepening frames, there was, moreover, an especial uniformity of character about the class that evidently gave the judges no little perplexity. The first act of these gentlemen, however, was a matter of simple justice about which there could be no dispute, when they did as everybody outside the sacred circle already had done, and that was, commended the whole of the entry. With their age so much in their favour, backed by the substance which Mr. James knows so well how to unite with high breeding, there was no getting away from the Mappowder beauties, though Mr. Roberts' pair at six months younger are so handsome and true, that, with time, they may yet catch their conquerors, who were in the very height of show condition. Over the others we can only echo the compliment officially paid to the class, as seldom so fairly deserved;

while a similar distinction was conferred on the small entry of two-year-old pairs, where Mr. Roberts reached first with two heifers of remarkably fine quality, and Mr. Turner, of The Leen, second with a couple of wonderfully well-grown animals. These two herds occupied similar positions amongst the yearlings, but with the Irvington Bury belles far better looking than their rivals from Leen, who were somewhat deficient in style and fashion. In the local division, there was only one separate class of bulls, or rather bull-calves; but these ran up to sixteen, with the winner bred by the late Mr. Rea, and a son of Sir Benjamin, which Mr. Taylor, of Showle, bought at the Westonbury sale, in the autumn, for eighty guineas. He has gone on wonderfully well since, and is growing into a square, handsome, kindly bull, with a famous touch and taking in many leading features after his sire. There was nothing very particular in the appearance of Mr. Hill's second here; and the bull-calves, as a lot, would bear no comparison with the companion class of heifers. A Hereford show could scarcely be got through without the steers having a place in it, and the entry of two-year-old pairs was, in its way, as admirable as anything on the racecourse. Again the judges turned and returned from one couple to another, until they ultimately settled over as capital a pair, either to scan or to handle, as any man ever had the chance of selecting or the pleasure of breeding. Mr. Morris, of Therrow, who had the best yearling bull at the last county show, was again the happy man; his pair, at some two or three months younger, quite standing over Mr. Shirley's second—a lower, more compact kind of beast, of a type now somewhat peculiar to the Baucott herd, and a very good type too, but still lacking something of the grandeur of the winning pair. In the customary classes of Hereford cattle, the old bulls were still chopping and changing about, with the massive, but active Chieftain, as bare as a deal board, first; and Tambarine, who has gone off sadly, and shows his very weak point behind the shoulder more than ever, a middling second. Still, a long, deep bull of Mr. Wooley's was highly commended; and a plain, dark son of Sir Thomas, exhibited by Mr. Hungerford Arkwright, also noticed. Despite his being disfigured by a surfeit, The Commodore is fast climbing up the ladder of fame: and, in a short class, his victory was a certainty, though Tom Brown is growing into a useful bull, and Claret is a thick, heavy animal at his age. There was only one other entry for the three prizes offered for the three-year-olds; but the two-year-old class resulted in more competition, with a new exhibitor, Mr. Rawle Paramore, to the fore. His young bull begins well with a handsome head and good forehead, but he is decidedly mean in his quarters; while the next best is chiefly commendable for his quality; and the third, a smart, straight, cheerful young bull, with a good touch, and, on a scale of points, not so inferior to any of his fellows. "The character" of the Hereford cow is a very sweet one, and it was well illustrated here in a very strong class, many of the entries having been winners not merely about home, but living in the records of the Royal Meetings. The first-prize, Beauty, but for getting gaudy about her quarters, is very near perfection; while, having been in the ring from a calf, she is, considering all things, still at six years old very presentable. Both the second and third are also very clever, with not much to choose between them; and

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Mr. Wigmore strengthens the show with a pair of his fine useful cows. Neither of the Hereford heifer classes was up to the excellence of the cows—the dozen or so of two-year-olds being led off by a dealer's beast, very bad before, and, to our thinking, not by any means so good as the second, a lengthy, clean, handsome heifer, that fairly beat Mr. Monkhouse's Newcastle calf for second; though a deal more discussion was got up over the placing of the three-year-olds, where the hitherto invincible Miss Hastings had to succumb. This heifer is certainly very level, being beautifully covered before, but she fails in her touch, where Mr. Pitt's heifer is wonderfully good; and the latter being pulled down by calving, we cannot, upon consideration, see any just cause for the question attempted to be raised over the decision. Mr. Longmore's third was a long way behind the other two; and if, for a West of England Meeting, the Herefords were unusually well represented in the ordinary classes, we must repeat that for a grand demonstration upon the part of the breeders one had to seek further on—amongst the more material matter of the local premiums.

The Devon men complained that the Society had travelled out of its own proper district; and, as they appear only always too happy to have an excuse how *not* to do it, few of the more famous breeders put in an appearance, and there was consequently another short show. There were in all only two old bulls; and Mr. J. A. Smith had not much difficulty in getting first with his bloodlike though somewhat delicate Constitution when pitted against the massive Viscount, even with the latter looking fresher and better than he has done of late. Blood told again amongst the three-year-olds, where Mr. Farthing was still second with a plain, coarse son of Sir Peregrine; but he improved amongst the yearlings—the most numerous of all the Devon classes—and took first very handsomely with a lengthy, short-legged bull with a deal of promise about him. Indeed, if proved by their produce, Viscount is better than Constitution, whose son—the third prize—is so far but a steery sort of beast, sadly wanting in the male character. The Somersets had it still more their own way with the cows and heifers, Mr. Farthing being first and second in the old class and first and third amongst the two-year-olds, there being but one three-year-old entered, and the judges not considering her worthy of more than a second prize, so that Mr. Bodley's triumph cannot count for much. Of the two prize cows, the first had never been shown before, while the second has taken Royal honours; and the contrast between Nature and Art was very suggestive of a moral, as the first-prize cow, even at two years older than the other, looks a deal the fresher of the two, preserving her fine line and clean character, unalloyed by that pampering held to be so essential in a preparation for every public ordeal. The first and second two-year-olds are a pair of rare heifers, the second of the two showing all that breeding for which the late Mr. Buller's herd was so noticeable; while the third prize, a great-grown substantial animal, some six months older than the other, was the best heifer-calf at Newcastle, and the second-best against a Shorthorn at Bristol.

The Shorthorns themselves, cosmopolitans though they be, were hardly at home here in Hereford, and we never remember a more uneven show of the sort, the bulls being almost generally indifferent. Still, the best of the old bulls is an animal of some repute, known as Lord Chancellor, and purchased by Mr. Sharpe, at the Babraham sale, for 400 gs., where he was a general favourite, as pronounced far superior to the Battersea medal calf, First Fruits. The Chancellor, however, has not gone on so well as he promised, and good as he is in his quarters, grand about his head, and rich in his colour, he is so palpably deficient forward as to prevent his ever taking any

very high rank in good company. Still he won at Tunbridge last autumn, and was the best bull again in Cornwall last week, where it is said he beat a very good class. He certainly met with no such competition here, the next best having been lately bought of a butcher, to whom "the Captain" had been consigned; and there was really nothing else to look at. The three three-year-olds were a yet worse lot, though all the premiums were duly awarded by the judges, who might have gone through the business with their eyes shut. Gondomar has little but his quality to recommend him, while Mr. King Tomb's second is a very middling steery animal to the eye; and one of the illustrious Butterflies, placed third, a narrow light-thighed flashy thing, that could have had no place whatever until you handled him. Another Butterfly, brought to Pencraig at 200 gs., was as good in his quality and hair as he was indifferent in his shape, being terribly split up behind, and high and light all over. However he got second to a smartish bull of some promise, bred and exhibited by Mr. Logan, and at all points about the best of the shorthorn bulls. Still, no doubt the Butterflies, like some other famous strains, would sell famously at an auction, especially if the company was properly packed, the animals themselves never suffered to come within hundreds of miles of the sale-room, and the whole "business" ably conducted, over a table hospitably littered with half-emptied bottles, the legs of chickens, and the claws of lobsters! The Shorthorn cows and heifers at Hereford were of a far better sample, and the *one, two, and three* of the award in the old class created a deal of attention, the more particularly as they stood side by side, and so invited continual comparison. The winner, Diadem, the best heifer at Bristol, and the third in her class at Newcastle, has grown into a fine lengthy cow, and point by point there was no mistake about her superiority to Mr. Sharpe's very neat cow, with her sweet head and altogether pretty looks; while Mr. Lynn's Pride, good as she would be in a state of nature, has been too long in the show line not to have suffered something, as in fact she is fast growing into a fat beast; but this counted up to her twenty-fourth premium, sixteen of which have been firsts. Mr. Logan, who is gradually making his way, was noticed for a very good cow, and more distinguished in the next class for his handsome heifer, deep, square, and light in her bone, with nice quality, and altogether bound to make a favourable impression, go where she will. These three, in fact, were all good again, Mr. Lynn's second being low and lengthy, and Mr. Sharpe's another very creditable addition to the prize-takers. The two-year-olds were a rougher lot, with the exception of the winner, a capital specimen of Mr. Stratton's sort, with symmetry and quality alike to recommend her. Mr. Sharpe and Mr. Holt Beever, two gentlemen who have both gone into the business of breeding Shorthorns with great spirit, will no doubt eventually hold yet higher honours than the second and third of this class; but Mr. Holland's herd does not show much advancement, and with three or four entries all standing together, Dumbleton never made its mark.

The sheep section of the show was very moderately made up. In the absence of Mr. George Turner and the Cornishmen Mr. Gould had it all his own way with the Leicesters, taking the prize for old rams with one bred at Holme Pierrepont, an entry which stands in good evidence of the Poltimore flock being put upon a proper foundation, as the prize pen of yearling ewes further confirms this. They are handsome and blood-like, with clean, thorough-bred heads, and full of quality from stem to stern, while Mr. Kingdon's second-best are not of so fine a type, and one of the late Mr. Buller's rams a very coarse sheep; but the commended ewes from the same flock have more style in their appearance. If the breeders in the far west were holding back for Plymouth, it is clear

that the Cotswold Hillmen are less and less inclined to show their hands before the Royal Meeting, and the entries from those parts were by no means imposing. Indeed, in the old class of rams, the first prize went to a large but coarse-bred one, "about home" here in Herefordshire; and Mr. Gillett from Oxfordshire produced the best shearing in a stylish well-grown ram, though his second lacked substance, and we fancy that Mr. King Tombs' very good sheep might fairly have changed places, in the return with the other one from Oaklands. There was no competition among the ewes, and Mr. Beale Browne, who generally gets to the front in this class, had to be content with a couple of commendations for his yearling rams. Unquestionably, however, the best of the Long-wools were to be found in the mixed class, into which Mr. Lynn, of Stroxton, sent three or four of that now popular cross between the Leicester and Lincoln; and a very happy illustration of "the nick" they afforded. With beautiful wool and great useful frames, these sheep are very neat and telling in their appearance, the high-bred air of the Leicester being still well preserved in their heads and at other points to which one must look for character. There was nothing very noticeable amongst the other Long-wools, saving perhaps Mr. Clifford's Cotswold and Ryeland ewes, which were as wretched a pen as ever took a prize, the judges, in the absence of any competition, being charitable enough to allow them a second. The Ryelands do much better when left to themselves, and they made a capital show in the local division, more particularly of yearling rams and the pens of ten ewes; the latter quite a sight to see, what with their rough coats, quick movements, and peculiar uniformity—the very sheep, as it is said, for the district. A little further on, we also find the famous Welsh mutton which Mr. Tucker displays so proudly in the Strand, but here embodied in a light, lithesome mountaineer, still seemingly as wild as if he had never left the recesses of Radnor Forest, or the side of the Black Mountain; though Mr. Rees explains to us that his pen of ewes have been victorious, long before to-day, at Abergavenny, Tredegar, and elsewhere. Would the Southdown like to try his quality with these heroes of the wilds and the hills? Well, possibly not, just at present, for the renowned Downs have but three supporters at Hereford—good Squire Farquharson, Mr. Neville Grenville, and Lord Radnor—and they divide the honours fairly enough amongst themselves, without creating anything like a sensation over the award. The best of the half-dozen Langton yearlings is by no means a wonder, either to the eye or the hand. Mr. Grenville's first old ram is a big slack-backed sheep, that was second at Exeter, and the Coleshill ewes are as pretty and *petite* as Mr. Moore can pick them out when he goes for the light-weights. The Shropshire Downs were far better represented, but still without gathering up to that formidable array this breed will occasionally present. Lady Willoughby de Broke, who has been fast coming to the front of late, had the best of the return, and her pen of ewes are very excellent, combining size and quality with uniformity of appearance—those three good Graces of a prize pen. Mr. Horton's ewes were also as good, as the neighbouring pen from Mr. Monkhouse's flock were bad, while Mr. Sampson Byrd's old ram is wearing wonderfully well, as at four years old he is still active on his legs, though furnished into a great heavy sheep. The second, shown by Mr. Reynolds Keeling, struck us as being rather coarse, though a ram much fancied by some flockmasters; while the first and second shearlings are both full of promise, and her ladyship's a wide and deep sheep of very fine character, that is sure to be heard of hereafter. Mr. Rawlence's West-country Downs, with their formidable frontispieces, are getting terribly coarse; and Mr. Wallis'

Oxfords, smart to look on and grateful to handle, had all the call, whatever the prize-list may say, amongst the Other Downs. The horned sheep, if not running into numbers, were generally good, and two of the three classes commended; but the competition was entirely confined to the Dorsets of Mr. Pitfield and the Somersets of Mr. Danger, who should drive a thriving trade with their call of the market.

Despite a laudable effort to do more in this matter, the horse-show of the West of England Society is still little better than a forlorn hope, and we rarely remember to have seen so many bad animals set-off by so few good. The agricultural classes resulted in short entries, with, however, a really good draught stallion amongst them called Black Prince, who with plenty of power has as much liberty, and never looked better than when he was "going" round the ring. The best cart mare was also a good one, and the Messrs. Howard sent an Essex bay filly for the two-year-old class, that had no trouble in disposing of her only competitor. Of the four hunter stallions paraded, one was a half-bred coacher, another a little clever hack, and the only two actually thoroughbred both were disqualified from hereditary unsoundness. The same fate, we believe, befel the best mare and foal, so that thus far the riding-horse gentlemen had but a negative business of it. With the young things there was more to do, although the weeding out was easy enough, even amongst the eleven four-year-olds, where a Yorkshire horse, now transplanted into Cumberland by Mr. Percy, so well known as the owner of the prize mare Crafty, was deservedly placed first, with an own brother to Captain Ballard's grey of last season for second. The winner is a useful powerful nag, but coarse all over, and the second a lathy light-thighed one, not near so good as his elder brother. It appeared somewhat strange that a very clever mare in this class, up to a certain weight and entered by Mr. Boughton Knight, should have been one of the first drafted, the more especially as it afterwards turned out that the judges had given her a commendation! The three-year-olds were a very curious collection, and of the yearlings there was nothing to take the eye, beyond a roan filly from Ledbury; but the two-year-olds, put for some reason or other in the local classes, were of a better sample. In fact, Mr. White of Lindors entered a couple of very smart colts by Verderer, that looked like placing themselves, the brown being a particularly nice horse. He was good alike to stand alongside of, or to order out, as handsome as need be, and a really sweet mover. However, he had unfortunately been a little too carefully got up, with his tail nicely squared, his coat with a bit of a polish on it, and so forth. The judges accordingly went further afield, and, to the manifest surprise of the outsiders, put their mark upon a great, awkward, big-limbed, black-brown that may eventually turn out a better hunter than the other, though he did not "prove" this at Hereford. Of the few ponies, Sir Charles Boughton's dun Welsh mare was very perfect, and Mr. Beever had another nice one by Revenge, but she was put out as not pony-bred, though otherwise the pick of her class. Mr. Percy's Islington cob, rather a vulgar clumsy customer after all, beat a more stylish one from Downton Hall; but Sir Charles' man is not much of a hand in the ring, whereas Mr. Percy has about the best showman out of Yorkshire to parade his horses, and that is something anywhere.

Going still in accordance with the moderate character of the meeting, the pig classes were rather under than over the average of a West of England show, and we missed many an exhibitor from Devonshire, where they maintain the fixture was too far out of the way. The chief hit in this section was made by a new exhibitor, Mr. Elmhurst Duckering, who sent some "out-and-out" good

whites from Lincolnshire, and indisputably claimed the best boar and best sow in any of the classes. Although entered as large pigs, they are neither too big nor too coarse, but are rather as remarkable for their quality as their symmetry, while they are active "up," and altogether of a very good sort. Mr. Stewart got a couple of seconds with his nice stamp of Berkshires, and Mr. Beevor had a clever black Suffolk that ranked first in an otherwise middling class of small boars. The first and second small sows both did a deal of credit to the Improved Essex, and Lord Radnor's couple of white sows were perhaps, after the Lincolnshires, the next best pigs in the show. Notwithstanding that Mr. Bailey, Mr. King Tombs, and Mr. Allender were represented, the Berkshires did not make the impression they have done, or should have done in such company.

Beyond the lines of implements, where business was terribly flat, and the trials in the fields, where even looking on was terribly hot, the West of England meeting did something even more than usual in the way of collateral attractions. There was not only the Art department, where you had the chance of getting an oil painting for half-a-crown; or the poultry show, where the excellence of Lady Holmesdale's Dorkings struck envy into the heart of Mr. Fowler, of Aylesbury; or the flower show, where wealth and beauty sought the grateful shade—but there was further the tasting of prize perry and cider, apparently rather an agreeable proceeding; the inspection of the famous Honiton lace and Her Majesty's order thereof, and a sheep-shearing match in the enclosure of the stand, and where father and son finished first and second, the young one having cut out his two sheep in the quickest time of any, but failing, according to the dicta of Messrs. Fooks and Turner, in quite equalling the nice clean work of his sire. Over all these departments the most active of Stewards are installed, whilst there are offices almost without number, for councilmen, directors, secretaries, editors, and so on. Still, it does strike one as rather curious, as at the same time especially inconvenient, that a society of the standing of the West of England cannot issue a prize-list upon authority, but that this always important record must be left over for half-a-year or so, when it really will appear in the next number of the *Journal*. At the Royal meetings the prize-list is out on the Tuesday morning, and there are many other associations of less calibre that are as careful in issuing an immediate and correct return of the awards. We believe ours to be as complete as possible, but as some of the commendation cards, if not premiums, were never put up until the Tuesday afternoon, the local press who brought out special editions must have heard of many an omission, not exactly to the blame of the reporter.

The General Meeting was held on the Wednesday, when Lord Portsmouth was elected President for the ensuing year, and Salisbury announced as the place of Meeting in 1866. The dinner was held on the same day, Lord Taunton, the President for the year, in the chair, when another discussion took place, between Mr. Acland and Mr. Holland, on the education of the farmer, apropos to the toast of the Royal Agricultural Society of England.

## PRIZES FOR CATTLE.

### DEVONS.

JUDGES.—J. Forester, Lytchett, Poole.  
J. Tapp, Twitchoen, North Molton.

Bulls above three years.

First prize of £12 to J. A. Smith, Bradford Peverell, Dorchester (Constitution).  
Second of £5 to W. Farthing, Stowey Court, Bridgewater (Viscount).

Bulls not exceeding three years.

First prize of £30 to the Representatives of the late J. W. Buller, Downes, Crediton.

Second of £10 to W. Farthing (Osborn).  
Third of £5 to J. Pitfield, Symondsburry, Bridport (Paris).  
Bulls not exceeding two years.  
First prize of £20 to W. Farthing (Tom).  
Second of £10 to J. Bodley, Stockley Pomeroy, Crediton (Lincoln).  
Third of £5 to J. A. Smith, (Hercules).  
*Highly commended*.—J. Bodley (Young Champion).  
Cows in-calf or in-milk.  
First prize of £20 to W. Farthing (Pink).  
Second of £10 to W. Farthing (Jenny).  
Third of £5 to J. A. Smith (Young Goldcup).  
Heifers in-calf or in-milk, not exceeding three years.  
Second prize of £8 to J. Bodley (Gay Lass).  
*No competition*.  
Heifers not exceeding two years.  
First prize of £10 to W. Farthing (The Belle of Stowey).  
Second of £5 to the Representatives of the late J. W. Buller.  
Third of £3 to W. Farthing (Duchess).

### SHORTHORNS.

JUDGES.—J. E. Jones, Springfield, Hereford.  
J. R. Singleton, Glendale, Pocklington.

Bulls above three years.

First prize of £12 to R. Sharpe, Courtlands, East Grinstead (Lord Chancellor).  
Second of £5 to J. Read, Southam, Cheltenham (Captain Jones 2nd).

Bulls not exceeding three years.

First prize of £20 to T. Garne and Son, Broadmoor, North-leach (Gondomar).  
Second of £10 to J. K. Tombs, Langford, Lechlade.  
Third of £5 to the Duke of Sutherland, Lilliehurst, Newport (Royal Buttery 15th).

Bulls not exceeding two years.

First prize of £20 to J. Logan, Maindee House, Newport (Royal Buck).  
Second of £10 to W. H. Beevor, Pencraig Court, Ross (Royal Buttery 17th).  
Third of £5 to G. Hitchman, Long Ashman, Bristol (Cupid).  
Cows in-calf or in-milk.

First prize of £20 to R. Stratton, Walls Court, Stapleton, Bristol (Diadem).  
Second of £10 to R. Sharpe (Elegant).  
Third of £5 to J. Lynn, Church Farm, Stroxton, Grantham (Pride).

*Highly commended*.—J. Logan (Annette 2nd).

*The class commended*.

Heifers in-calf or in-milk, not exceeding three years.

First prize of £12 to J. Logan (Charlotte 4th).  
Second of £8 to J. Lynn (Pamela).  
Third of £4 to R. Sharpe (Lilac).  
Heifers not exceeding two years.

First prize of £10 to R. Stratton (Garland).  
Second of £5 to R. Sharpe (English Emily).  
Third of £3 to W. H. Beevor (The Victory).  
*Highly commended*.—E. Holland, Dumbleton Hall, Evesham.

### HEREFORDS.

JUDGES.—J. Ford, Rushton, Blandford.  
E. Gough, Gravel Hill, Shrewsbury.

Bulls above three years.

First prize of £12 to J. A. Hollings, The Hellend, Hereford (Chieftain the Second).  
Second of £5 to W. Taylor, Showle, Ledbury (Tamarine).  
*Highly commended*.—T. Woolley, Weston Court, Pembroke (Earl Derby the Second).  
*Commended*.—J. H. Arkwright, Hampton Court, Leominster (Dan O'Connell).

Bulls not exceeding three years.

First prize of £20 to T. Duckham, Bayaham Court, Ross (Commodore).  
Second of £10 to W. Taylor, Showle (Tom Brown).  
Third of £5 to T. Thomas, St. Hilary, Cowbridge (Claret).

Bulls not exceeding two years.

First prize of £20 to J. R. Paramore, Dinedor Court, Hereford (Dinedor).  
Second of £10 to H. Gibbons, Hampton Bishop, Hereford (Grateful).  
Third of £5 to W. Tudge, Adforton, Leintwardine (Douglas).  
*Commended*.—T. Smith, Bodenham, Much Marcle, Dymock (King Charles the Second).

Cows in-calf or in-milk.

First prize of £20 to W. Perry, Cholestrey, Leominster (Beauty).  
Second of £10 to J. Farr, Pontrilas, Hereford (Diana the Second).

Third of £5 to T. Thomas, St. Hilary.  
*Highly commended*.—J. Walker, Westfield House, Holmer (Longwaist).

*Commended*.—G. Pitt, Chadnor Court, Dilwyn, Leominster (Sunshine); J. Wigmore, Bickerton, Much Marcle, Dymock (Stately 3rd); and J. Wigmore (Hirt).

Heifers in-calf or in-milk, not exceeding three years.  
First prize of £12 to G. Pitt.

Second of £3 to J. Baldwin, Luddington, Stratford-on-Avon (Miss Hastings 2nd).  
Third of £4 to J. Longmore, Lucton, Leintwardine (Moss Rose).

*Commended.*—H. Ridgley (Nanny).

Heifers not exceeding two years.

First prize of £10 to H. Ridgley, Steventon, Ludlow (Betay).  
Second of £3 to P. Turner, Leen, Pembridge (Queen of the Vale).

Third of £3 to J. Monkhouse, The Stow, Hereford (Fairy Queen).

*Commended.*—W. Taylor.

### SHEEP.

#### LEICESTERS AND OTHER LONGWOOLS.

Judges.—J. Clarke, Long Sutton.

T. Stamper, Highfield, Oswaldkirk.

Yearling Rams.

First prize of £10 to J. Gould, Poltimore, Exeter.

Second of £5 to J. Gould.

*Highly commended.*—J. Gould.

*Commended.*—S. Kingdon, Lynch, Thorverton (for two rams).

Rams of any other age.

First prize of £5 to J. Gould.

Second of £3 to the Representatives of the late J. W. Buller.

*Highly commended.*—J. Gould.

*Commended.*—J. W. Buller.

Pens of Yearling Ewes.

First prize of £10 to J. Gould.

Second of £5 to B. Kingdon.

*Highly commended.*—Representatives of the late J. W. Buller.

#### COTSWOLDS.

Yearling Rams.

First prize of £10 to J. Gillett, Oaklands, Charlbury.

Second of £5 to J. Gillett.

*Highly commended.*—J. K. Tombs.

*Commended.*—T. Beale Brown, Salperton Park, Andoversford (for two rams), and E. Handy.

Rams of any age.

First prize of £5 to Mr. O. Kearsey, Glewstone, Ross.

Second of £3 to Mr. E. Handy, Sierford, Cheltenham.

*Highly commended.*—J. Gillett.

*Commended.*—E. Handy (for two rams).

Pens of Yearling Ewes.

First prize of £10 to J. Wells, Hampnett, Northleach.

Second of £5 to J. Wells.

*No competition.*

#### OTHER LONG WOOLS.

Yearling Rams.

First prize of £10 to J. Lynn, Church Farm, Stroxton, Grantham (Leicester).

Second of £5 to G. K. Radmore, Court Hayes, Thoverton, Devon (Long-wooled).

Rams of any other age.

First prize of £5 to J. Lynn, (Lincoln Leicester).

Second of £3 to J. Lynn.

*Highly commended.*—G. K. Radmore, Pitt Farm, Thoverton.

*Commended.*—A. Kampton, Bromley, Ross, and G. K. Radmore.

Pens of Yearling Ewes.

Second prize of £5 to H. M. Clifford, M.P., Llantillo, Aberavenny (Cotswold and Ryeland cross).

#### SOUTH-DOWNS AND OTHER DOWNS.

Judges.—H. Mayo, Cokers Farm, Dorchester.

H. Woods, Merton, Thetford.

Yearling Rams.

First prize of £5 to J. J. Farquharson, Langton, Blandford.

Second of £5 to the Earl of Radnor, Colehill, Highworth.

Rams of any other age.

First prize of £5 to R. N. Grenville, Butleigh Court, Glasbury.

Second of £3 to the Earl of Radnor.

*Commended.*—R. N. Grenville.

Pens of Yearling Ewes.

First prize of £10 to the Earl of Radnor.

*No competition.*

#### SHROPSHIRE.

Judges.—F. W. Bowen, Shrawardine Castle, Shrewsbury.

G. Curreton, Beach House, Shrewsbury.

Yearling Rams.

First prize of £10 to the Lady Willoughby de Broke, Comp-ton Verney, Warwick.

Second prize of £5 to T. Horton, Harnage Grange, Shrewsbury.

*Commended.*—C. Reynolds Keeling.

Rams of any other age.

First prize of £5 to B. Byrd, The Leese Farm, Stafford.

Second of £3 to T. Horton.

*Highly commended.*—T. Horton.

*Commended.*—Lady W. de Broke.

Pens of Yearling Ewes.

First prize of £10 to Lady Willoughby de Broke.

Second of £5 to T. Horton.

*Highly commended.*—C. Randall, Chadbury, Evesham.

#### OTHER DOWNS.

Yearling Rams.

First prize of £10 to J. Rawlence, Bulbridge, Wilton, Salisbury (West Country Down).

Second of £5 to J. Rawlence.

*Commended.*—G. Wallis, Old Shifford, Bampton, Farringdon (for 2 Oxfordshire Down rams).

Rams of any other age.

First prize of £5 to G. Wallis (Oxfordshire Down).

Second of £3 to J. Rawlence (West Country Down).

Pens of Yearling Ewes.

First prize of £10 to J. Rawlence (West Country Down).

Second of £5 to J. Rawlence.

#### SOMERSET AND DORSET HORNS.

Yearling Rams.

First prize of £10 to A. J. Pitfield, Eype, Bridport (Dorset).

Second of £5 to T. Danger, Huntville, Bridgewater (Somerset).

*The class commended.*

Rams of any other age.

First prize of £5 to J. Pitfield.

Second of £3 to J. Pitfield.

*Commended.*—J. Pitfield.

Pens of Yearling Ewes.

First prize of £10 to T. Danger.

Second of £5 to J. Pitfield.

*The class commended.*

#### MOUNTAIN SHEEP.

Rams of any age.

First prize of £10 to J. Ricketts, Trebarried, Bronllys.

Second of £5 to E. Farr, Penworlod, Hay.

#### HORSES.

##### FOR AGRICULTURAL PURPOSES.

Judges.—J. Bosley, Hereford.

B. Howard, Temple Bruere, Sleaford.

Stallions not exceeding eight years old.

First prize of £30 to W. Thorn, Godney Farm, Wells (Black Prince).

Second of £15 to J. Hyde, Riffin Mill, Bodenham, near Leominster (Barton).

*Highly commended.*—J. F. Howard, Britannia Farms, Bedford (Young Clyde).

Mares and Foals, or in-foal.

First prize of £15 to J. B. Fowler, Tunby, Cirencester (Bonny).

Second of £5 to W. Thorn (Smart and foal).

Colts foaled in 1863.

First prize of £20 to H. Hitchcock, Chitterne All Saints, Heytesbury (Albert).

Second of £10 to Lady E. Foley, Stoke Edith Park, Ledbury (England's Pride).

Fillies foaled in 1863.

First prize of £10 to J. and F. Howard (Depper).

Second of £5 to J. E. Jones, Springfield, Hereford.

*No further competition.*

#### HUNTERS AND HACKS.

Judges.—Captain Barlow, Hasketon, Woodbridge.

H. Thurnal, Royston.

Thorough-bred Stallions.

*The prizes withheld.*

Mares and Foals, or in-foal.

*The prizes withheld.*

Mares or Geldings foaled in 1861.

First prize of £25 to H. J. Percy, Howsenrigg, Aspatria (Ingleby).

Second of £10 to Captain J. S. Ballard, The Verlands, Cowbridge (Oakwood).

*Highly commended.*—J. G. Watkins, Woodfield, Droitwich (Three Legers).

*Commended.*—J. C. James, Burghill, Hereford (Don Juan), and A. B. Boughton Knight, Downton Castle (brown mare).

Fillies or Geldings foaled in 1863.

First prize of £15 to J. White, Lindors, Coleford (Lindors).

Second of £5 to B. L. Williams, Velin Newydd (Wren).

Colts or Geldings foaled in 1864.

Prize of £10 to J. Embry, Much Birch.

Fillies foaled in 1864.

Prize of £10 to S. Smith, Woodmanton, Ledbury.

Mares or Geldings for Hacks, not exceeding 15 hands high.

First prize of £10 to H. J. Percy, Howsenrigg (Robin).

Second of £5 to Sir C. H. Rouse Boughton, Bart., Downton Hall, Ludlow.

Stallion Ponies of any breed, not exceeding 13 hands high.

*No entry.*

Mare Ponies of any breed not exceeding 13 hands high.

Prize of £5 to Sir C. H. Rouse Boughton (Judy).

*No competition.*

### PIGS. LARGE BREED.

JUDGES.—T. Turner, Seaford, Lewes.  
J. Whippell, Barton, Exeter.

Boars not exceeding two years.

Prize of £5 to R. Elmhurst Duckering, Northope, Kirton Lindsey (white Lincoln).

Boars not exceeding one year.

First prize of £5 to W. Yella, Round Robin Farm, Highworth (Berkshire).

Second of £3 to A. Stewart, Saint Bridge House, Gloucester (Berkshire).

Sows in farrow, or that have farrowed.

First prize of £3 to R. Elmhurst Duckering (white Lincoln).

Second of £3 to A. Stewart (Berkshire).

Pens of Breeding Sows, not exceeding nine months.

First prize of £5 to J. K. Tombs (Berkshire).

Second of £3 to R. Elmhurst Duckering (Lincolnshire).

### SMALL BREED.

Boars not exceeding two years.

First prize of £5 to Ebenezer Reese, Ross, Herefordshire (white).

Second of £3 to J. Pittfield, Symondsburly (black Dorset).

Boars not exceeding one year.

First prize of £5 to Rev. William Holt Beaver, Pencraig Court, Ross (black Suffolk).

Second of £3 to Ebenezer Reese (white).

Sows in farrow, or that have farrowed.

First prize of £5 to E. Coles, Stone Farm, Yeovil (black Essex).

Second of £3 to E. Coles.

Pens of Two Breeding Sows, not exceeding nine months.

First prize of £5 to the Earl of Radnor (white).

Second of £3 to E. Coles (black).

### PRIZES OFFERED BY THE HEREFORD LOCAL COMMITTEE.

#### HEREFORD CATTLE.

Bull, Cow, and Offspring, the calf not exceeding one year.

First prize of £20 to J. Baldwin, Luddington (Battersea, Duchess of Bedford 2nd, and a heifer calf, Rose of Bedford).

Second of £10 to Philip Turner, The Leen (Bolingbroke, Ariel, and calf, Sunbeam).

Third of £5 to R. H. Capper, Northgate (Orphan, Dainty, and heifer calf, Dainty the 2nd).

Bulls calved in 1864.

First prize of £15 to W. Taylor, Showle (Triumph).

Second of £7 to R. Hill, Orleton Court, Ludlow (Umpire).

Third of £3 to T. Evans, Irvington Bury, Loominster (Patron).

Pairs of Heifers calved in 1862.

First prize of £10 to T. Roberts, Irvington Bury (Perfection and Prima Donna 2nd).

Second of £5 to Philip Turner, Leen (Eugenie and Fickle).  
*The class commended.*

Pairs of Heifers calved in 1863.

First prize of £10 to T. Roberts (Duchess of Bedford 3rd and Duchess 3rd).

Second of £5 to P. Turner, Leen (Sylvia and Norma).  
*Highly commended.*—J. H. Arkwright, Hampton Court, Loominster (Hampton Olive and Perfection).

Pairs of Heifers calved in 1864.

First prize of £10 to J. W. James, Mappowder Court, Blandford (Estella and Maud).

Second of £5 to T. Roberts (Favourite and Prima Donna 3rd).  
*The class commended.*

Pairs of Steers calved in 1862.

First prize of £10 to W. Taylor.

Second of £5 to H. Gibbons, Hampton Bishop.

Pairs of Steers calved in 1863.

First prize of £10 to T. Morris, Thetrow, Hay, Brecon.

Second of £5 to R. Shirley, Baucott.  
*Highly commended.*—James Taylor, Stretford Court, Leominster.

Pairs of Steers calved in 1864.

First prize of £10 to W. Perry, Cholestrey, Leominster.

Second of £5 to H. Rawlins Evans, jun., Swanstone Court, Leominster.

#### WELSH CATTLE.

*No entry.*

#### SHEEP.

##### RYELANDS.

Yearling Rams.

First prize of £10 to J. B. Downing, Holme Lacey, Hereford.

Second of £5 to J. B. Downing.

Rams of any other age.

First prize of £5 to J. B. Downing.

Second of £3 to T. Smith, Bodenham, Much Marcle, Dy-

Pens of ten Ewes.

First prize of £10 to J. B. Downing.

Second of £5 to J. B. Downing.

Yearling Ewes.

First prize of £10 to J. B. Downing.

Second of £5 to J. B. Downing.

*Highly commended.*—T. Pitt, Free Town, Ledbury.

#### SHROPSHIRE.

Pens of ten Ewes.

First prize of £10 to W. Taylor, Thinghill Court, Hereford.

Second of £5 to A. Armitage, Dadnor, Ross.

*Highly commended.*—T. Davies, Burlton Court, Hereford.

Yearling Wethers.

First prize of £5 to C. Randall, Chadbury, Evesham.

Second of £3 to A. Armitage.

#### LONG WOOLS.

Pens of ten Ewes.

First Prize of £10 to J. Davis, Wehton Court, Hereford.

Second of £5 to T. S. Bradstock, Cobrey Park, Ross.

Yearling Wethers.

First prize of £5 to C. Kearsley.

Second of £3 to W. Yeomans, Stetton Court, Hereford.

#### CLOSE-WOOLLED WHITE-FACES.

Yearling Wethers.

Prize of £5 to J. B. Dowling (Ryeland).

#### WELSH MOUNTAIN SHEEP.

Pens of six Ewes.

Prize of £10 to R. Rees, Coldbrook Cottage, Abergavenny (Radnor Welsh mountain).

*Highly commended.*—E. Parr, Penyworlod, Hay (pure Radnor).

#### HORSES.

Colts foaled in 1863.

Prize of £10 to E. Nicholas Hoygate, Buckland, Loominster.

*Commended.*—J. White, Lindors, Coleford.

Fillies of 1863.—*No entry.*

Hacks not exceeding 14 hands high.

First prize of £10 to J. Hungerford Arkwright.

Second of £5 to E. Farr, Penyworlod, Brecon.

Ponies not exceeding 13 hands, bred in Wales or on the Border.

First prize of £5 to T. Cummins, Brecon.

Second of £3 to T. Lewis Webb, Hoyley, Hereford.

VETERINARY INSPECTOR—Professor Browne.

#### WOOL.

JUDGES.—T. Clarke, Pershore.

W. George, Hereford.

Long Wool.

Five Tag Fleeces.—Prize of £5 to Wm. Yeomans, Stretton Court, Hereford.

*Highly commended.*—Alfred Kempson, Bromley, Ross.

Ryeland Wool.

Five Tag Fleeces.—Prize of £5 to W. Taylor, Showle Court.

*Highly commended.*—J. B. Downing.

Shropshire Wool.

Five Tag Fleeces.—Prize of £5 to W. Taylor, Thinghill Court.

*Highly commended.*—T. Davies, Burlton.

#### HOPS.

JUDGES.—R. Davis, Hereford.

J. Smith, Worcester.

Samples of Hops grown in the County of Hereford.

First prize of £5 to J. B. Vevors, Yarkhill Court, Ledbury.

Second of £3 to W. Taylor, Showle Court.

*Highly commended.*—W. Taylor, Thinghill Court.

*Commended.*—W. Taylor.

#### CIDER.

JUDGES.—H. C. Beldice, Hereford.

W. C. Berryman, Wells.

J. Bosley, Hereford.

H. C. Townsend, Stevenston, Upton Pyne.

Six Bottles, the Produce of 1863.

First prize of £5 to G. Palmer, Bollitree, Ross, Herefordshire.

Second of £2 to Jas. Seib, Dordhill House, Kingston Taunton.

*Highly commended.*—Wm. English, Hawkerland, Hereford.

Six Bottles, made from Foxwhelp Fruit, the produce of 1864.

First prize of £5 to H. and J. Yeomans, Canon Pion, Hereford.

Second of £2 to Wm. Hill, Egleton Court, Ledbury.

*Commended.*—J. B. Vevors, Ledbury.

Six Bottles, made from any other than Foxwhelp Fruit, the produce of 1864.

First prize of £5 to T. Davies, Burlton.

Second of £2 to C. Ockey, Moor-end Farm, Castle Frome.

*Highly commended.*—H. and J. Yeomans.

*Commended.*—H. and J. Yeomans, and T. Pitt, Free Town, Ledbury.

#### PERRY.

JUDGES.—T. Clarke, Derridale, Hereford.

J. Pitt, Temple Court, Bosbury.

W. Raiston, Hereford.

Six Bottles, the produce of 1863.

First prize to Rev. C. H. Bulmer, Credenhill Rectory, Hereford.

Second to T. Oliver, King's Pion, Weobly, Hereford.

Highly commended.—H. Hope, Marden, Hereford.

Six Bottles, the produce of 1864.

First prize of £5 to Wm. Hill, Eglestown.

Second of £2 to John Wigmore, Bickerton, Much Marcle, Dymock.

Highly commended.—T. Pitt.

### THE IMPLEMENT DEPARTMENT STANDS ON THE GROUND.

CLAYTON, SHUTTLEWORTH, AND CO., Lincoln.—Eight and five horse power single cylinder portable engines, and combined double blast thrashing, finishing, and chaff elevating machines.

HORNBY AND SONS, Grantham.—Eighthorse power portable engine, new improved thrashing and finishing machine; new selfacting swathe delivery, new side sheaf delivery, and new onehorse back delivery reapers; new grass mower, with two knifebars; tenrow corn and seed drill, corn dressing machine, three and five-tined wrought horsehoes, turnip cutters, root pulpers; an assortment of wrought iron single furrow, double furrow, and moulding ploughs; washing, and combined washing, wringing, and mangling machines; and India rubber wingers.

HOLMES AND SONS, Norwich.—Sixhorse power portable engine and combined thrashing and finishing machine, portable cloverseed sheller, circular-saw table; twelverow corn and seed, threeerow seed and manure, twoerow roller ridge, two and oneerow hand barrow, and small occupation corn and seed drills; fore carriage steerage, broadcast manure distributor, and corn and seed sowing machines; small seed drill, with coulters; corn-dressing machine, barley hummeller, and rotary weed extirpator.

ROBEY AND CO., Lincoln.—Eighthorse power single cylinder portable engine, and combined double blast thrashing and finishing machine.

GILBERT, Evesham.—Eighthorse power portable engine and combined thrashing and finishing machine, corn-dressing machine, pair of twin harrows, five and threeerow cup and threeerow nut and brush drill and grass and seed distributor.

FOSTER, Lincoln.—Eighthorse power portable engine and thrashing and finishing machine.

GARRETT AND SONS, Leiston.—Four and three horse portable engines and combined thrashing and finishing machines, improved lever corn drills and horsehoe, manure distributor and corn-dressing machine.

GIBSON'S, Wantage.—Sevenhorse power portable engine and combined thrashing and finishing machine.

MARSHALL, SONS, AND CO., Gainsborough.—Nine, six, and five horse power portable engines and combined double blast thrashing and finishing machines, one machine (new implement) being adapted with grinding apparatus, arranged within the frame of the machine, by which means corn, after being separated from the best sample, can be passed through the grinding mill and reduced to feeding meal in one operation.

THE READING LEON WORKS (Limited), Reading.—Seven and three horse power portable engines and combined thrashing and finishing machines, fourhorse power horizontal fixed engine, thrashing machine and horsegear, double action hay-maker, horse-rakes for hay, improved chaffcutters for hand and power, oilcake breaker, barley aveller, grass and seed broadcast sowing machine, winnowing machine, and combined sackcart and holder.

BRAD AND CO., London.—An assortment of Ross's conical butt stone corn mills, of different sizes, for grinding barley and corn, and kibbling peas and beans.

RANSOMES AND SIMS, Ipswich.—Eighthorse power portable engine and combined thrashing and finishing machine, ninety gallon water or feeding pan; light iron pony, onehorse, light and heavy twohorse, general purpose, light, heavy, and general purpose iron beam, wood beam, solid beam double furrow, ridging, iron moulding, subsoil, and hoe ploughs; sets of wrought iron trussed whippetrees, for two and three horses; sets of three solid beam, medium, and three jointed harrows; selfcleaning rotary corn screen, bean cutter on iron column; steel oat, combined steel bean and oat, and "universal" mills; twohorse iron horsegears, and lawn mowing machines of different widths.

BARROWS AND CARMICHAEL, Banbury.—Sixhorse and threehorse power portable engines, sixhorse spring shaker thrashing machine, and American grist mill on four wheels.

SAVORY AND SON, Gloucester.—Improved single cylinder tenhorse power portable engine.

TASKER AND SONS, Andover.—Eighthorse power portable single cylinder engine and combined thrashing and finishing machine, winnowing machine, fifteen coulter corn and seed drill, and sets of Seaman's trussed beam iron harrows and scuffle drags.

HUMPHRIES, Pershore.—Sixhorse power portable engine and combined thrashing and finishing portable clover and land corn dressing machines, self-acting cider mill and portable double cider press, cider press, screws, saw table and fittings, and lifting jack.

RUSTON, PROCTOR, AND CO., Lincoln.—Tenhorse, eighthorse, and fivehorse power portable engines, and thrashing and finishing machines, circular-saw benches, semi-portable flour mills, and centrifugal pump.

UNDERHILL, Newport, Salop.—Sixhorse power portable engine and treble blast thrashing and finishing machine, combined planing, sawing, moulding, and tenoning machine, nine, seven, and five-tined cultivators, ridging plough, sets of light "Bedford" and chain harrows, balance ball horse rake, barrow, two furrow turnip or mangold drills, "gapping" drills, corn elevator, grubber, horse hoe, sheep-rack, trough, and fencing, cattle crib and trough, cheese press, and specimens of light and strong game fencing.

TUXFORD AND SONS, Boston.—Eighthorse power portable steeple engine with vertical cylinders, tenhorse and threehorse power portable engines with horizontal cylinders, combined treble blast thrashing and finishing machine, straw elevator (new implement) for elevating straw up a trough by a belt, with a series of carriers attached to it: a loose chain, running over a couple of pulleys above the carriers, and driven in the same direction, aids the ascension, and prevents action of the wind upon the straw. Appold's centrifugal pump and circular-saw table.

THE PARRETT WORKS, Martock.—Eighthorse and two-and-a-half-horse power portable engines, and combined flax breaking and scutching machine, onehorse cart and sets of wheels and axles.

BROWN AND MAY, Devizes.—Eighthorse and two-and-a-half-horse power portable engines, and combined thrashing and finishing machine.

HOLMAN, London.—Four-horse power portable engine with Holman's "cannon" pump attached, the same pump on bed plate complete to work for steam power, centrifugal pump and four-inch "Britannia" force pump (Holman's patent).

HUNT AND PICKERING, Leicester.—Upright portable engine, corn crusher, chaff cutter, root pulper, oil and cotton-cake breaker, an assortment light land, heavy land, moulding, and general purpose ploughs, cultivators, one-row horse hoe, three-beam and chain harrows, iron field roller, ten and twelve-row corn and seed, one-row and two-row turnip, manure, and mangold drills, sack barrow, twitch rakes, oil-cake breakers and corn crushers, sack root pulpers, compound lever cheese presses and garden seats.

PICKSLEY, SIMS, AND CO., Leigh, Manchester.—Chaff cutters of various kinds either for hand or power, an assortment of oat, oil-cake, and bean mills and crushers, steel grinding mills, bone-rasping mill, core pulper, four-horse power combined engine and firehorse boiler, treble action turnip cutter, American horse rakes, twohorse gear, one and twohorse mowing machine, two-horse reaping machine, lawn-mowing machines, assortment of garden and hall chairs, wringing and mangling machines, set of whippetrees, quantities of hand drag rakes, light and strong pattern single and double "Norfolk" pig and hog troughs, cattle water or feeding troughs, grindstone and iron troughs, assortments of hay and manure forks, and sack trucks of different sizes.

HINDLEY, Bourton.—Five-horse power portable engine, combined thrashing and finishing machine, apple mill, screw cider presses, and cider screws.

ASHBY AND JEFFERY, Stamford.—Double-action hay-makers of various strengths, steel toothed horse rakes, wheel hand rake, chaff cutting machines for hand or power, with apparatus for preventing accidents, improved double-action oil-cake mills, patent rotating and chain harrows, locust bean mill, onehorse gear works, twenty-four inch stones flour mill,

four-and-a-half-horse power engine, and patent steel crank shield.

FOX AND WALKER, Bristol.—Eight-horse power portable engine for agricultural use.

BISSELL, Wolverhampton.—Circular-saw bench; combined vertical saw frame and engine; moulding and planing, tenoning, hand lever, boring, and morticing machines; lifting jack and cramp.

TURNER, E. R. AND F., Ipswich.—Four-horse power portable engine; an assortment of hand and power crushing or bruising mills for linseed, malt, oats, and barley; mills of the same kind, combined with apparatus for splitting or grinding beans; and oilcake breakers.

POWIS AND CO., London.—Morticing, tenoning, and boring, and hand sawing machines, and joiner's saw bench.

RICHES AND WATTS, Norwich.—Portable engine; improved grist mills; portable self sharpening American grist mills; and chaffcutter with entirely new arrangement of knives.

TURNER'S PATENT STRAP AND HOSE COMPANY, Manchester.—Rolls of patent single leather driving straps of different widths for engines and machinery; patent leather hose and block rope.

ALLCHIN AND SON, Northampton.—Seven-horse power, steel boiler, portable engine; corn grinding mill and screwjacks.

BRADFORD, Manchester and London.—Patent weighing and wringing machines, of various sizes, in combined and separate forms; indiarubber wringers, box mangle, new churn, and butter-making machines.

AVELING AND PORTER, Rochester.—Eight-horse and ten-horse power locomotive engines for agricultural purposes; and set of travelling rope porters for steam cultivation.

CARSON AND TOONE, Warminster.—A selection of chaff cutting engines for steam, horse, or hand power; Moody's turnip cutters; oilcake crushers; wrought iron horsehoes for hill or flat surfaces; single and double cheese presses, with double levers and pulleys; self-cleaning cross cut wheel iron, field, and garden rollers; three-share scarifier; wrought iron ploughs; and wood and iron sack trucks.

BOBY, Bury St. Edmunds.—A variety of corn screens; the same with blowers and separators; double action haymakers; barley aveller; malt and gravel screens.

THE BEVERLEY IRONWORKS, Beverley.—Three and two horse reaping machines; serrated and plain field rollers; model one-horse, Leeds one-horse, pony, harvest, light spring, and market carts; two or three horse waggon; liquid, manure, or water cart; sets and pairs of patent wheels and axles; bone and compound action mills.

NICHOLSON, Newark.—Double action tubular shafted hay-making machines; horse rakes, oilcake breakers, and sack lifter; patent garden roller; combined weighing machine and sack lifter; and registered bottle rack.

ROBERTS AND SONS, Bridgwater.—Malvern, market, and Whitechapel carts; and combined mail phaeton, dog cart, and wagonette.

HOWARD, J. AND F., Bedford.—Pair of fourteen-horse patent ploughing and traction engines (new implements). The boilers are placed across the frame-work of these engines, by which arrangement the water-level on the steepest hill never varies sufficiently to leave any part of the fire boxes or tubes uncovered, neither is steam space diminished, upon whatever incline the engines may be working. Set of steam cultivating and ploughing apparatus; steam harrows; improved iron water cart; traction engine truck; combined steam ridging and subsoil, iron dwarf, general purpose, heavy iron swing, iron subsoil, double breast or ridging, and potato raising ploughs; iron horse rakes; double action haymaking machines; patent flexible four-beam, jointed three-beam, iron drag, and four-beam handled drag harrows; trussed and two and three horse iron whippetrees; wrought iron harrow carriage; draught gauge for ploughs or other implements; and ridging and subsoil plough bodies.

MILFORD AND SON, Thorton.—Leeds one-horse, Gloucester one or two horse, Plymouth one-horse, carts; two-horse and double shaft waggons; and improved lifting jack.

SMITH BROTHERS, Thrapston.—Double action haymaker; improved horse rake; new grist mills for steam, hand, or horse power; improved bean and cake mills; safety horse power; and iron sheep cribs with concave covers.

COULTAS, J., JUN., Grantham.—Twelve and eleven row corn, five row and four row turnip, mangel, and manure drills;

fore carriage steerage; ten-row corn horsehoe, and five-row turnip horsehoe.

FRY, A. AND T., Bristol.—Hannam's harvest, improved farm, agricultural, crank axle, pony and chaise carts; water cart; Woods' two-horse and one-horse mowing and reaping machines; American horse rakes, sheep rack, steel tooth hay collectors, grass seed, and seed and manure drills; apple mill, and cider screws.

CRANSTON, W. M., London.—Patent haymaker with crank action.

WOOD, W. A., London.—Wood's grass or clover mowing machines, one-horse reaping machine, and Wood's revolving self-rake reaping machine.

BENTALL, Heybridge.—An assorted collection of patent chaff cutters for hand, horse, and steam power; patent root pulpers, Gardner's turnip cutters, oat and bean kibblers, roller mill, oilcake breaker, single ridge hoe, broadshare, subsoil plough, horse gear and intermediate motion.

SAMUELSON & CO., Banbury.—Automaton rake reaping machine, one horse reaping machine, grass mowing and lawnmowing machines, chaff cutters, combined chaff cutter and corn crusher, single and double action turnip cutters, double-action haymaking machine, oilcake breakers and root pulper.

CAMBRIDGE & CO., Bristol.—Notched and plain wheel roller and clod crushers, patent jointed and self-expanding harrows, combined tine and chain ditto, two and three-wheel land pressers, horse rake and combined washer and wringer.

KELL, S. A. & H., Gloucester.—A selection of general purpose extra strong light land, light swing, and double breast ploughs; sets of light general purpose and heavy harrows, chain harrows, Scotch grubber, wrought iron scarifiers, and horse hoe, five tined scuffler, ring and self-cleaning rollers, six feet clod crusher; eleven, twelve, and thirteen lever corn drill; manure distributor, three and five-row corn drills, turnip and mangold drill, Boby's and Samuelson's haymakers; weighing, washing, and wringing machines; cake breakers, corn dressing machines, corn crusher, sheep trough, sack barrow, and combined sack barrow and holder.

PAGE & CO., Bedford.—Draining pipe and tile machines, general purpose and light wrought iron wheel ploughs, double breast plough, one row and expanding horse hoes, five and seven tine lever scufflers, one-horse gear work, improved two-knife chaff cutters, linseed cake mills, disc root pulper, sets of diagonal iron and patent twitch harrows, improved leverage hay and corn raker for horse power, wrought iron land roller, sets of wood equalizing and tubular-iron whippetrees and bench drilling machine.

RICHMOND AND CHANDLER, Manchester.—An assortment of chaff cutters for hand, horse, and steam power; corn crushers, two-horse iron framed driving gear, steaming apparatus, sack holder, root washer, and bread kneading machines.

WIGHTMAN AND DENNY, Chard.—Haymaking machine, horse rake, cheese press, corn and pulse bruisers, sets of horse gears, sack cart, combined apple mill and corn crusher, and combined turnip duster and manure distributor.

JOHNSON AND WHITTAKER, Leigh.—A variety of chaff cutters both for hand and power, oilcake mill, root pulper and combined pulpers, strippers and slicers, combined lawn mowing, rolling, and collecting machines; double cylinder garden rollers, and improved horse gear.

REEVES, R. AND J., Westbury.—Four, three, and two-row liquid manure and economical Wiltshire manure and seed drills; three row manure and seed, eleven-row lever corn, and seven-row small occupation corn drills; broadcast manure distributors, portable harrow pump, winnowing machine, and corn separator, weeding paddle or thistle destroyer, and Richards' water cart (new implement). The water flows from the barrel of this cart at the centre, instead of bottom of the end of the cistern; and the water is carried from the bottom of the barrel to the centre, when being emptied, by a simple contrivance used in turning the barrel, aided by an inside partition. The advantage thus offered is a better balance when at work on hill sides, and easier draught. A delivery pipe is fixed to the centre of the barrel, and sufficiently high for steam-cultivating engines or liquid manure drills.

COLEMAN AND MORTON, Chelmsford.—Assorted five and seven tined cultivators suitable for use on light and heavy lands, improved potato digger, and self-adjusting rope porter for steam cultivation.

SMITH, Kettering.—Patent steerage horse hoes for wheat



and turnips, improved double blast winnowing machines, improved sack trucks, loaf sugar chopper with treddle attached, and improved currant and raisin dressing machine.

BALL and SON, Rothwell.—Iron ploughs for light and heavy land and ridging purposes, sets of diagonal and general purpose iron harrows, seven-tine scarifier, chain harrows, one and two wheel iron horse hoes, iron horse rake, one and two horse farm carts, and light two-horse waggon.

NALDER and NALDER, Wantage.—Machine-made corn screens with an arrangement for separating stones or other rubbish from samples, noiseless winnowing and corn dressing machine, patent sackholder, adjustable sack holder and cart, two-tine horse hoe and improved sack cart.

HUGHES and SONS, London.—French runner mill stones, French bed mill stones, smut machine, corn measures, sack barrows, mill bands, sets of iron blocks, and an assortment of tools used in manufacturing mill stones.

MCSGRAVE BROTHERS, Belfast.—Three stall and loose box model stables, patent harmless loose box manger fittings, ventilators, stable furniture of all kinds, iron cow house fittings, iron piggery; slow combustion, encaustic, and conservatory stoves; glazed tiles, &c.

FULLER, Bath.—Park express, pony, and wire seated phaetons; landau, light brougham, pair-horse carriage, and gentleman's break.

IRELAND, Strangeways, Manchester.—A collection of newly-invented churns of different sizes; the dashers or agitators in these churns are made to move in three distinct ways—rotary, vertical, and oscillating—so as to cause greater agitation of milk or cream.

M'NAUGHT & SMITH, Worcester.—Pair-horse landau, Whitworth and Light Malvern dog carts.

WALTON & CO., Worcester.—Washing and mangling machines separate and combined, India-rubber wringers and Canadian clothes dryer.

NEWNAM & SON, Bath.—Bath, landau, waggonette, and "gadabout" pony and horse carts.

JOHNSTON, London.—A large collection of butter churns of different sizes, and Baker's mangle.

HADLEY, Cambridge.—Horse drag rakes; wrought iron cattle, pig, and sheep drinking and feeding troughs.

SHATTOCK & CO., Gloucester.—Sets of brown "Scotch thillers" harness, saddles, bridles, whips, and other harness-room requisites.

WHITGROVE, Worcester.—Waggonette, agricultural, Malvern and other dog carts; light park phaeton, and sets of plated and brass-mounted harness.

HILL & SMITH, Brierly Hill.—Light skim or scarifier, light land roller, painted and galvanised iron sheep troughs, rotary gravel screen, iron wheelbarrows, ditto for heating tar, &c.; specimens of black varnish, japanned game-proof wire netting, wrought-iron ornamental garden seats and tree guards, wrought-iron vermin-proof tick stands, field gates, entrance gates, wicket gates, with cast-iron pillars complete; wrought-iron hurdles; continuous, strained, galvanised iron sheep, ox, and deer fencing; also tools for fixing ditto.

ROWE & JONES, Worcester.—Worcestershire cooking ranges, open baths, garden furniture, and kitchen requisites.

BROWN & CO., London.—A collection of Green's and Shank's lawn-mowing machines, garden roller, barrow engine, platform weighing machines, wrought-iron hurdles, continuous fencing, ornamental entrance gates, garden ornaments, vases, and other furniture, washing and wringing machines, prepared fencing wire, and wire netting, and domestic flour mill.

LARKWORTHY & CO., Worcester.—Seaman's iron harrows and ploughs, "duck-footed" scuffle drags, sets of steel plough whippetrees, and steel equalizing plough whippetrees.

PLENTY, Newbury.—Wrought-iron water or liquid manure carts, galvanised iron sheep and cattle troughs, and set of three Berkshire harrows.

WOODS & COCKSEGE, Stowmarket.—Universal barley, malt, oats, and linseed mills for hand or power; oilcake breaker, farmer's portable grinding mill, improved turnip cutters, root graters or pulpers, iron horse-powers, with intermediate motion, also with pulley.

YOUNG, J. & T., Ayr.—Improved double and single driving-wheel, combined reaping and mowing machines, double-drill turnip and mangold-sowing machine, double and single cheese presses and card mill.

CORMELLI, Cheltenham.—Liquid manure or street-watering

carts, wrought-iron cisterns, cattle troughs, and corn bin; hand water cart for watering cattle, portable gas apparatus, and gas meters.

BAKER, Wisbeach.—Combined blowing and dressing machines, suitable for all kinds of grain.

GLIDDON, Williton.—Open cooking ranges for large and small occupations, apparatus for heating and scalding milk, &c.; double-action lift pump, saddle boiler for heating greenhouses, hot water coil, roasting apparatus, stoves, stove boiler, and bath.

WILKINS & SONS, Calne.—Cheese-making apparatus, and platform for same; improved curd mill, milk and whey strainers, liquid manure and farm pumps, meat choppers and sausage machine, and tin milking pails.

DODGE, London.—Assorted vulcanized machine-driving bands, double texture waterproof covers, india bucket and deck straps, ditching and malting boots, india-rubber tubing and hose.

PURRETT, Banwell.—Specimens of improved cider colouring, and bottled "champagne" cider.

WEBB & Co., Diglis, Worcester.—Agricultural manures of different kinds artificially prepared.

FREEMAN & HARDON, Strangeways, Manchester.—Compound cake for cattle feed, and condimented food also for stock and horses.

BAYLIS, Beckford.—Waterproof composition, water boots, hollow cooking skewers, and ebony polishing blacking.

WORTH & PONTIFEX, London.—A mixed assortment of implements and utensils, principally for household and dairy use.

BARBER, Liverpool.—Five-horse mowing machine, with arrangement for raising or depressing cutting bar as required, combined mower and reaper similarly constructed.

REYNOLDS, JNO., London.—A collection of garden furniture, consisting of fancy and plain wirework, in the shape of flower stands, trainers, fencing, latticing, &c.

TURNER and BISHOP, Leighton Buzzard.—Twelve-row corn and seed drill; independent steerage (Bedfordshire), and six-row corn and seed drills; hand press, with corn drill; two-horse thrashing machine and gear work; grinding and crushing mills; light and heavy land ploughs; cultivators or scarifiers.

SAWNEY, Beverley.—Combined corn dressing, blowing, and screening machines for small occupations; oscillating cinder sifter, riddling machine, treadle grindstones, boot cleaner, and sack lifter.

JONES, Gloucester.—Specific for foot-rot in sheep; composition for waterproofing and softening leather of all kinds; the same for brown leather, harnessing, and saddles.

HELLIWELL, Hauxtonthorpe.—Lawn and general purpose scythes; chaff, hay, machine or engine, and thatching knives.

WHITE and CO., London.—Earth closets, with apparatus for deodorizing excrement matter; and separate parts for ditto.

INDIA-RUBBER CO., London.—Specimens of vulcanized and ebonite articles of many kinds.

JENNINGS, Hereford.—Ladies' hunting and other saddles and bridles; harnessing and stable-room requisites of all kinds.

WHITE, London.—Machinery oil feeders, oil cans, artificial feeders for lambs, pigs, &c., leather driving bands, clothes' wringers, washers, and driers.

LYON, London.—A collection of machines for chopping and mixing meat, fruit, and vegetables; and other kitchen requisites.

DAY, SON, and HEWITT, London.—Complete farmers' medicine chests, and pamphlets on the breeding and management of cattle.

CHILDS, London.—Grain separators, "Clipper" grass mowers, double furrow plough, self-feeding hand circular-saw bench, carriage lifting jack, broadcast seed sower, American washing machine, self-adjusting clothes wringer and starcher, and "California" lift and force pump.

ROBINSON, Leeds.—Self-acting vertical bench drilling machines.

DAVIS, Linton.—Chaffcutter, cider mills, cider press, and cider press screws.

AVERY, London.—New tubular churn, composed of a tub, through the cover of which are inserted two water tubes, closed at the bottom, and an air tube open throughout; the water tubes are for the purpose of tempering the cream, and the air tube admits air to aerate it.

BRIDGES, London.—Specimens of butter prints and other dairy articles.



CLAY, Wakefield.—Patent cultivators and eradicators, horse hoes, and chain harrows.

MAUNDER, Ottery St. Mary.—Reaping machines of light construction, and with back or side deliveries.

BURROWS, Broadclist.—Reaping machines with tilting platforms.

JAMES, Tivoli, Cheltenham.—Liquid manure distributors; improved force pump, liquid manure pump and suction pipe; improved liquid manure and street water carts; general purpose cart; washing, wringing, and mangling machines; hand mortar tempering machine; and improved "gapping" drill for filling in patches missed by drill.

SMITH AND SONS, Hereford.—Broadcast manure distributor, three-row seed and manure drill, ridge drill for turnips and mangels, haymaking and grass mowing machines, reaping machine, horse rakes, combined corn dressing machines, and model horizontal steam engine.

EDDY, Kenford.—Sets of two-wheel iron ploughs for light, general purposes, and heavy land uses; wrought iron horse hoe, iron tooth horse rake, iron rotary machine for sifting gravel, &c., turnwrest ploughs, three and four-beam iron drags, sets of iron and chain harrows, and single pulverizing iron ploughs.

GARDENER, Gloucester.—Open and close French burr runner millstones, Derbyshire Peak millstones, prover, millstaffs, and mill-pecks for dressing millstones.

MILFORD, Thorverton.—Improved plank-sided two-horse waggon and one horse cart; also farm cart for general use.

LATCHAM, Hereford.—Two and a-half horse power vertical engine, portable tubular boiler, stone roller cider mills, wrought iron cider mill screws, ditto with oak press complete, pair of French millstones, five and two-knife chaffcutters, turnip cutter, small Indian-corn or bean ribbler, and two-horse power machines.

BALL, North Kilworth.—One or two horse carts for general farm purposes.

BADGER, Worcester.—Sets of patent diagonal cross-bar harrows, close fire ranges.

BROWN, BROTHERS, Lyme Regis.—Open and closed steaming and cooking apparatus, and other kitchen furniture and utensils.

BAKER, Compton, Berkshire.—New portable iron liquid manure cart, and portable water cart.

HARDING, Dursley.—Two-horse and one-horse Wood's grass mowing machines and one horse reaping machine with skeleton drop platform.

WAIDE, London.—A collection of barrel and tub churns of various sizes.

HILL, Leominster.—Light two-wheel dog cart, one horse waggonette, and double-seated pony carriage.

HADLEY, Worcester.—Victoria sociable and reversible waggonette and dog cart phaeton.

SILVESTER, London.—Silvered tubes for milking cows, siphons, expanding tube brushes, wringing machine, and edge tool sharpeners.

PERKINS & BELLAMY, Ross.—Wrought-iron water carts for horse and hand power, wrought-iron sheep troughs, iron tank, sheep and ox hurdles.

STONE, Newport, Monmouth.—Light chaise, spring market and cranked axle wine carts, light spring meal waggon and cart, farm carts with 4½, 3½, and 2½ inch wheels.

PARNELL, Exeter.—Lots of plated harnessing, hunting and other saddles, and harnessing generally.

BAMLETT, Thirsk.—Two-horse grass-mowing machine, and two-horse and one-horse reaping machines.

COLEMAN, London.—Samples of palmtree-meal, palmtree kernels, palm oil, linseed oilcake, Cliff's antiseptic fluid and salve, foot-rot mixture, and carbolic acid.

THE HEREFORDSHIRE AGRICULTURAL MANURE AND CATTLE FOOD COMPANY.—Samples of manures of various kinds, suited to the growth of all kinds of crops.

COLTHURST, SYMONDS, & Co., Bridgwater.—Roman tiles, patent zig-zag and eave tiles for farm building purposes.

AMIES, BARFORD, & Co., Peterboro'.—Patent wrought-iron water-ballasting rollers, for field and garden purposes; wrought-iron cylinder land rollers and clod crushers, set of farming steaming apparatus, and American corn-grinding mills.

STEEL, Canonpyon, Hereford.—Strong general purpose and other wheel ploughs, swing and double-farrow ploughs, horse rake, lever scarifier, horse hoes, sheep troughs, sets of light and heavy harrows, Cambridge and cross cut rollers, and Suffolk drill.

DAVIES, Englefield.—Combined horse hoe and potato digger, adjustable harrows, and patent sack holders.

WEIGHELL, Pickering.—Four and three horse power thrashing, shaking, riddling, and dressing machines, and portable stone grinding mill.

HARWOOD, London.—Sundry articles for domestic use, branding irons, lead and iron type for farmer's use, steam filling water gauges, wringing and starching machine, and mincer.

KENT, London.—A large assortment of domestic utensils, principally for kitchen use.

STOW, Hereford.—Four-wheel dog cart and waggonette.

HANCOCK, Tipton.—Pulverizing plough, bone mill, butter machines, and butter purifier.

GRIFFITHS, Ludlow and Leominster.—Pair-horse light barouche, light park phaeton, and waggonette for one or two cobs.

WHEELER & SONS, Gloucester.—A collection of agricultural seeds and grasses, suitable for permanent pasture.

BEACH, Dudley.—Specimens of farinaceous food for cattle and sheep, condiment for horses, meal for milking cows, feeding meal, and superfine flour.

SUTTON & SONS, Reading.—A collection of one thousand separate kinds of seeds, one hundred and fifty dried specimens of grasses, collection of pots showing growth of above, collection of samples of various agricultural seeds, and pots showing growth of same.

TURNER & SPONG, London.—An assortment of sausage and mincing machines, cases of weighing machines, and other articles of domestic use.

TOMLINSON & HATWARD, Lincoln.—Assortments of Tomlinson's butter powder, for the more speedy production of butter during the process of churning.

WEIR, London.—Washing, wringing, and mangling machines, corn crusher and grinding mills, flour mills and dressing machines, box, single action, and double action churns, spirit draining levels, sets of dairy utensils, milk syphon, india-rubber wringers and crimpers and goffering machines.

SIMPSON'S CATTLE SPICE COMPANY, Hull.—Canisters of Simpson's horse and cattle spice, barrels of Simpson's cattle spice, and packets of digestive powders for horses.

HOPKINS, Ledbury.—Moveable-headed Coburg and circular-shaped greenhouse.

MURCH AND SPENCE, Bridgwater.—Apparatus designed for heating pits, hothouses, and public buildings generally.

SALKELD, London.—American washing and wringing machines, clothes dryers, American grist mill, iron and wood pivot boring machine, miscellaneous samples of wire fencing and bread cutter.

BAKER, Bristol.—Sets of carriage and cart harnessing, saddles, bridles, and other articles for stable use.

ROWERRY, Hereford.—Centrifugal current drying machine.

CULLINGFORD, Stratford, London.—Cocoa-nut fibre netting for sheep folds, and netting for sporting, farm, and garden purposes.

PIGGOTT, London.—Rick cloths, waterproof hay sheets, tarpaulins, and models of flags.

CARTER AND CO., London.—Collection of samples of mixed grass seeds for permanent pastures, collection of pots showing growth of these, collection of agricultural seeds, samples of garden seeds, and collection of dried natural grasses.

PARHAM, Bath.—Iron field and tubular iron gates, ornamental entrance and other gates, strained fencing, iron railings, iron framed tent, and iron railings, and cast-iron memorial inscriptions.

CRANSTON, Birmingham.—Patent conservatory, greenhouse, either for portable or permanent use. The parts are capable of being screwed together, and the glass slipped into watertight grooves.

ALLEN, Westminster, London.—Twelve-horse power double expansive portable engine (Allen's patent) by Tuxford and Sons, Boston.

FOWLER AND CO., Leeds and London.—Eight-horse power set of steam cultivating machinery with windlass, three-furrow plough, anchors, ropes, rope porters, &c., complete.

## WORK IN THE FIELD.

On the first day of these merely illustrative trials, free from all the interest or incentive of direct competition, Fowler and Howard showed some steam-ploughing and cultivating on

light stony land with a strong bottom. The tackle of the former was lighter than usual, but the engine was similar to that sent to Newcastle, and the work was done quick and deep. Howard's ploughing was very excellent, and the cultivating in fair comparison one with the other. On the second day these two rival firms moved to another field of strong clay. Fowler only ploughed in four "bouts," and then went on to digging or cultivating. The work done was at about 8 in. deep, and very good, but with less finish in appearance than Howard's cultivating work. Many judges present expressed an opinion that Fowler would do better if he could effect more complete inversion of the furrow-slices than shown at Hereford. Howard's ploughing was again very good, the work straight, and like horse-ploughing. Depth 9 to 10 inches.

In the exhibition of horse ploughs, Howard, Ransomes and Sims, Ball and Son, Hunt and Pickering, and Larkworthy, went to work with ordinary ploughs, and Eddy, of Kenford, with his pulverizing turnwrest plough. Eddy's implement worked very well, but the draught was thought excessive. The class of work done with the other ploughs throughout was good; preference to be given to the Howards, and the Ransomes. Howards used their common plough with digging breast attached, which excited some interest, for turnip lands in spring, or deep cultivation in autumn.

In the horse-cultivators section, Coleman and Morton, Kell,

and Hunt and Pickering went to trial. The work done altogether was good, with the superiority in favour of Coleman and Morton. These trials were made in the same field as that in which the horse-ploughing was done—an old clover ley—hard, dry, and stony.

The grass mowers entered were Wood's, Samuelson's, Picksley and Sims', Bamlett's, and Barber's machines were worked on Tuesday and Wednesday in a field of light grass near the show-yard. All those machines did good work, the order of merit being, first with Woods, next with Samuelson and Bamlett, and then in due succession Barber, and Picksley and Sims. The reapers were tried in a field of tall green rye, where the machines on the ground were Wood's one-horse skeleton drop platform, Samuelson's tilt-platform, both of which seemed to be easily worked by horse and man, leaving the bundles in good shape. Barber worked his "Eagle" reaper with the old system of a reel and side, delivery by manual labour; while Barrows and Carmichael's, as also Bamlett's machines, were put on, and Hornsby and Sons tried their new machine combining the self-acting and manual delivery. All the reapers worked well, though the general opinion was all in favour of the small one-horse power, with Wood's machine for choice. The two haymakers on trial were Nicholson's and Howard's, and the work done pretty equal, but with Nicholson's standing first in public favour.

## ESSEX AGRICULTURAL SOCIETY.

### MEETING AT BRENTWOOD.

The annual meeting of the Essex Agricultural Society at Brentwood on Tuesday showed that progress is still being made by the association. Never before have the entries been so numerous. At the first meeting at Chelmsford in 1858 they totted up to 311, and four years later at Halstead they still stood at only 337. At Witham in 1863 they rose to 418; at Harwich in 1864 they stood at 401; and this year they went at another bound to 592. This year's meeting compares as follows in the various departments with that held in 1858 at Chelmsford:—

	1858.	1865.
Horses ... ..	143	201
Cattle ... ..	83	144
Sheep ... ..	36	98
Pigs ... ..	42	58
Wool ... ..	7	9
Donkeys ... ..	—	12
Total ... ..	311	523

The Essex society may, in fact, be fairly said to have become an efficient and popular county association, which will doubtless go on and prosper. It is important, however, that quality as well as quantity should be aimed at by the society. The show of carthorses was not particularly first-rate, which may be attributed perhaps to the rule of the society debarring animals which have previously received prizes from again competing. This rule kept away such entries as Chester Emperor, Mr. Rist's Emperor, the worthy son of an eminent sire, Mr. Wilson's Briton, Mr. Crisp's May Duke, Mr. Tomline's Beauty, Sir Thomas Lennard's Canterbury Nun, and others. The first prizes for cart stallions went to a roan shown by Mr. W. Elphick, of Burnham, which stood second at Harwich last year: he has good quarters and shoulders, but a light neck. In two-year-old colts Mr. W. H. Walter of Wennington took the first prize with an entry descended from Hero, rather a smart animal, but not considered quite perfect in his hind legs. Mr. W. S. Wright's General Lee, which had the second prize, is on the other hand weak in his forelegs. The cart mares were a moderate class, and Mr. Croxon of Burnham had both prizes. In mares with foals Mr. Ward was an easy winner with Brick, which has taken several prizes previously; while Mr. Ward was also winner in three-year-old fillies. Both his animals took special prizes, one as the best mare on the ground, and the other as the best filly. Sir Thomas Lennard showed a neat and promising three-year-old filly by Hero, which took the second prize. The cart geldings were a useful

lot, Mr. Polley winning easily with an entry standing upwards of 17 hands high; although it is a short-legged horse, there is plenty of muscle and stamina about him. In two-year-old fillies the Chester Emperor blood again stood Mr. Badham in good stead; his two prize entries were small but neat. The yearling colts provoked some adverse criticisms. Mr. R. B. Wingfield Baker of Orsett, the Liberal candidate for South Essex, took the first prize with a colt by Mr. McIntosh's Star out of a Suffolk mare; the second prize was won by a colt by Mr. Meeson's Captain. The yearling filly prize was won by Sir T. B. Lennard, whose entry was by Emperor, dam Canterbury Nun; the fore legs are not so good as those of the dam, and the filly is also not perfect about the neck. The plough horses were a good plain working lot; the prize went to Mr. Parson of Boxted. A bay and grey shown by Mr. Bray were highly commended; they stood over 17 hands and were very powerful animals. An All-England prize of £25 for the best cart stallion was won by Mr. C. Boby, of Stutton, Suffolk, with Young Hero, by Sir Thomas Lennard's Hero, dam by Old Briton, winner of the first prize at the meeting of the Royal at Shrewsbury. Young Hero, who took a prize in 1864 at the Great Newcastle show, is an exceedingly fine and powerful animal, if perhaps a little too "leggy." The competition for a £10 prize, open to all England, for entire cart colts, was confined to Essex, and resulted in favour of the entry of Mr. W. H. Walker, which has already been noticed. A Brentwood town prize for the best cart mare was won by Mr. Ward with an entry descended from Ward's Briton; this was an All-England prize, but the only competition which had to be sustained proceeded from Suffolk. Mr. Ward had a strong competitor in Mr. Tomline, M.P. We now pass to riding and coaching horses. Mr. P. Portway took the £15 prize for thorough-bred stallions with Young Sultan, a very powerful three-year-old, with a head, however, which was not considered quite "perfect." The prize of £10 for stallions not thorough-bred was won without competition by Mr. Gogg's Fireaway Shales by Mr. Savage's Fireaway, which was sold at Downham fair in 1862 for 500 guineas; the son is not considered a very worthy representative of the sire, his colour not being particularly pleasing, while his head is somewhat too large and his legs too long. No award was made in hunting mares, although three were shown:—Mr. H. Denne's Banshee, Mr. F. Barker's Faith, and the Hon. F. Petre's Nutpecker. The hunting geldings were a very good lot. Mr. W. W. Chafy's Don Juan, Loadstone, and Free Trade, Mr. A. S. Robinson's Duck and Grey Plover,

Mr. Lescher's Gay Lad, Mr. Coope's Pipe Clay, Col. Davis' Woodpigeon, and Mr. Offin's Swing, all attracted a large share of attention. The contest lay, however, between a brown horse shown by the Hon. F. Petre, a ten-year-old shown by Mr. E. Nid, and Mr. Offin's The Baron, aged, breeder unknown. The Baron has only one eye, but on being set a going by Mr. F. Barker he took some hurdles in capital style, and the judges unhesitatingly decided that his single eye did not disqualify him from being a good hunter; in fact, he carries himself well, and has a good hunting air about him. The hackney mares were not particularly first-rate. A useful animal shown by Mr. Lescher had the first prize; though a Welsh cob, Rebecca, shown by Mr. J. G. Fry, would perhaps have been more fortunate had she been ridden better. Some good action was shown by Pretty Jack, exhibited by Mr. J. Hutley, of Little Braxted. In the hackney gelding class the prize went to Taffy, a useful well-made Welsh cob. An entry by Sir T. B. Lennard was described as by Rinaldo, but the same time it was added the "breeder unknown"—rather an unintelligible affair. The brood mares with foals were useful, but not very superior animals: Mr. A. Francis took the first prize, foal by Tom. In ponies, an entry by Mr. Barker was discarded, being in fact a powerful little horse under 14 hands high, and a nice roan pony shown by Mr. Coope secured the first prize. An All-England prize of £25 for thorough-bred stallions was won by Sir T. B. Lennard, with Mainstone, by King Tom out of Blister, bred by Lord Palmerston. Mainstone ran Thormanby at Goodwood to a neck, and in the following year ran in the Derby; he was then the property of Lord Palmerston. As he took the first prize at Halden in 1862, he cannot enter again for an Essex prize. Captain Barlow was highly commended for Ace of Clubs, by Stockwell out of Irish Queen, bred by Lord Annesley; and this horse certainly attracted quite as much notice and admiration as Mainstone; nearly all his points are good, with plenty of fashion and fine action.

The cattle were generally good, Essex having several spirited Shorthorn breeders within its limits. The first prize for Shorthorn bulls was won by Mr. Bray's Prince Royal by 3rd Duke of Thornedale, dam Princess Alice. Prince Royal is a red roan, calved April 28, 1862; he is somewhat narrow between the fore legs. Marquis Cornwallis by Sir Charles, dam Miriam, exhibited by Mr. Clayden, was second: he is a good broad animal. The first prize in two-year-old Shorthorn bulls was disputed by Mr. James Christy, of Roxwell, and Mr. Clayden. Mr. Christie showed Potomac by Roderick, dam Prunella, a bull with plain fore-quarters. Mr. Clayden was second with Lord Paramount by Marquis Cornwallis, dam Flirt by Kirklevington. In yearling Shorthorn bulls Mr. Clayden took the first prize with Belvidere, a rich roan, by Marquis Cornwallis, dam Blanche 3rd, and the second with Marquis of Bute, by the Englishman, dam Miriam. In Shorthorn cows Mr. McIntosh's Lady Bates, a roan calved June 6, 1861, by 4th Duke of Oxford, dam Lady Bates Second, and a pedigree too long to recapitulate, took the first prize: she has a good head and touch, but is a narrow cow. Mr. Sturgeon's Sweetbread by Captain Barclay, dam by Sugarplum, was second: she has light fore-quarters. The class generally lacked condition. The two-year-old Shorthorn heifer prizes went to Mr. H. Taylor, of Hazeleigh Hall, who showed Gipsy Countess by Amorous, dam Star, and Fancy by Amorous, dam Duchess: both of these heifers showed good blood. The Shorthorn yearling heifers were also worthy of notice. Mr. Christy took both prizes, one with White Dove by Tragedian, dam Ringdove; the other with Fieldfare by Tragedian, dam Frauline. Mr. Upson's fat prize ox was by Captain Bloomer. Neither the fat oxen nor the fat cows call for much comment. In the latter, Mr. Oxley Parker was first. Mr. Tippler's Spotty, which received the first prize in cows or heifers for dairy purposes, appeared to be a good milker. Janet, a pure Ayrshire, shown by Mr. J. W. Morris, was second. A heifer-calf, shown by Mr. McIntosh, and with a pedigree as long as your arm—Princess 2nd, red and white, calved June 13, 1864, by 3rd Duke of Thornedale, dam Lady Sale, by Old Rowley, &c.—took the prize in its class, and, if blood goes for anything, ought to bring a good many premiums to its owner in the next half-a-dozen years. Mr. McIntosh also showed a very promising bull-calf, with good coat and quarters—Grand Duke of Essex 2nd, calved August 2, 1864, by 3rd Duke of Thornedale, dam Lady Bates 2nd. Mr. Clayden had a very fair second-best in Archdale, a rich roan, by Noble Arch, dam Rosette. Mr. Bray took a £20 All-

England prize for the best pure-bred bull with Prince Royal, to which allusion has been already made. We have spoken thus far of shorthorns. The other pure-bred bulls, cows, &c., exhibited were principally Alderneys, mostly bred in the island, but some raised in Essex. For details in these classes we must refer the reader to the prize list.

Before passing on to speak of sheep and pigs we ought, however, to state that in shorthorn cows and heifers not pure bred—but good serviceable animals, nevertheless—most of the prizes were carried off by Mr. W. Sworder, of Stapleford Tawney as that Lieut. Col. Brise, Mr. Collinson Hall, and Mr. Giblin had also some good fortune. Now for the sheep. The prizes for Southdown rams were divided between Sir T. B. Lennard and Mr. T. W. Bramston, M.P.: their entries were good neat sheep, but very small. In rams of any other shortwoolled breed, the contest lay between Mr. Emson and Mr. Portway and the former took first with a polled Norfolk. In Cotwolds rams, Mr. Giblin was pre-eminent. There was a more active competition in Oxfordshire or Shropshire Down rams. Mr. Giblin was first with Oxford, and Mr. Hicks second with Shropshires. Sir Thomas Lennard was first in the shearing Southdown ram class: entries again of small size. The sheep with which Mr. Portway won both prizes for shearing shortwoolled rams were Suffolk Downs. The excellent Southdown blood at the command of Sir Thomas Lennard secured him both prizes for shearing pure Down ewes; he was not so fortunate, however, in contesting the shearing Southdown wether class with Lord Braybrooke, his lordship being first. The cross-bred or longwoolled were rather an ordinary lot. Mr. C. Squier took the first prize with some cross-bred wethers, Kent and Shropshires. A £10 All-England prize was offered for longwoolled rams, and tempted Mr. Hugh Aylmer into the field with an entry which was very generally admired, being three feet across the back when lying down, with an estimated weight of 33 or 34 stone; this sheep took the third prize, we believe, last year at the Lynn meeting of the Norfolk Society. A corresponding £10 prize, open to all England, for the best shortwoolled ram was won by Sir T. B. Lennard, with a very closely-clipped Southdown. All-England prizes of £5 each, given by the town of Brentwood, for shearing long-woolled ewes, shearing Kent ewes, and shearing short-woolled ewes, were awarded as follows: The first to Mr. Sewell, who had no competition in long-woolled ewes; the second to Mr. Jackson, and the third to Sir T. B. Lennard, who won with his inexhaustible Southdowns, competing against Mr. Howard's Oxford Downs; the latter were highly commended, having plenty of size, and being of a nice description. Some five Cotswold shearing rams were exhibited by Mr. Sexton, as extra stock. The best boar was declared to be shown by Sir T. Lennard. He had wide hind-quarters, and was low in the back; the Wenlock breed, of which Mr. Lescher showed a specimen, are white. Brentwood town prizes, open to all England, were given for black and white boars, and were each won by Mr. G. M. Sexton. Mr. Sexton's black boar was a younger brother of the winner at Harwich and Newcastle last year, and he is a very well-formed animal. The same may be said of Mr. Sexton's white boar, which had excellent points. We must give a line or two to the donkeys, which provoked a good many grins. The prize animals showed what the donkey—the poor despised donkey!—may become, with kind and careful treatment. The show of wool was scant; in fact, in this regard, the position of the Society appears to be stationary.

The judges of implements were Mr. P. Hobbs, Basingstoke, and Mr. F. Whitlock, Yeldham. There being, however, no special novelties on the ground, the prizes offered by the society in this department were not awarded. Mr. Collinson Hall, of Navestock, exhibited his five-horse power high-pressure steam engine, his furrow plough, scarifier, anchor, and rope-porter. The scarifier was one of ten times, stirring a breadth at each passage of four feet six inches, to a depth of eight or nine inches. The principal new feature introduced into the arrangements was Hall's steel-link rope, which will, it is expected, avoid the delay and loss occurring with wire rope. The work done was well executed, although the space in which the apparatus was tried was exceedingly limited.

We cannot compliment the society very much upon the dinner proceedings. The dinner itself was substantial enough, and was served in the new Townhall, which was decorated for the occasion, and provided with a raised platform for the chairman, the Hon. F. Petre, and the principal guests. The speeches

were a repetition of the long string of common places which distinguished last year's gathering. It was some time before anything at all savouring of excitement occurred; but, on the eve of a general election, and with county magnates of opposite politics sitting in dangerous contiguity, it would have been strange indeed if an incident of something like an explosive character had not arisen. Accordingly, Mr. Du Cane could not resist the opportunity of alluding to what he termed "a speech of surpassing eloquence and energy," which had just been uttered by Mr. Wingfield Baker. Mr. Wingfield Baker retorted by exclaiming "question, question," when Mr. Du Cane, referring to the judges, said the men of Essex liked old friends. The "men of Essex," repeated Mr. Du Cane, "are not in the habit of deserting or forsaking old friends;" and Mr. Baker, apparently smelling a political rat in the emphases with which the gratitude of the "men of Essex" was enforced, again cried "Question, question." Mr. Du Cane rejoined that he was speaking very much to the question, and proposed "The Judges;" and as the meeting was drawing to a close, and every one was hot and tired, the threatened explosion was averted. Mr. Spooner responded for the judges, in the only speech to which the epithet of "practical" could be applied, and even then in only a limited sense. We may sum up Mr. Spooner in a very few words. The cattle, he said, were excellent—never yet surpassed. The sheep and pigs were also good. As for the horses, among a great deal that the judges had looked at with pleasure, it must be acknowledged that there was room for still further improvement, and it was necessary that care should be paid to correct principles of breeding. Mr. Badham responded for "The exhibitors"; but Mr. Badham is a man of brevity. Mr. Coope, the great Romford brewer, proposed "The visitors," and, alluding to France, said he was old enough to remember the wretched beef and mutton one used to meet with in Paris in former days. Now, in these regards the French were quite equal to us; thanks, however, to the introduction of English stock into France. With this comforting reflection, the party broke up.

## PRIZE LIST.

## AGRICULTURAL HORSES.

Judges.—W. Horn, Broom Farm, Scole, Norfolk.  
J. Thomas, Bletsae, Beds.  
W. C. Spooner, Southampton.

Essex stallions, having served not less than 20 mares.—First prize of £15 to W. Elphick, Burnham; second of £5 to G. Richardson, Burnham (Captain). Highly commended, W. Thompson, jun., Thorpe (Garibaldi); commended, G. Carter, Danbury (Young Champion).

Entire two-year-old colts.—First prize of £20 to W. H. Walker, Wennington; second of £5 to W. S. Wright, Wethersfield (General Lee).

Cart mares, not under four years old.—First prize of £8 to A. B. Croxon, Burnham (Blossom); second of £4 to A. B. Croxon (Silver). Commended, G. D. Badham.

Cart mares, with foals at foot.—First prize of £10 to J. Ward, East Mersea (Brick); second of £5 to J. A. Piggot, Beckingham Hall.

Three-year-old fillies.—First prize of £5 to J. Ward; second of £3 to Sir T. B. Lennard. Highly commended, J. Wray, Great Yeldham.

Cart geldings.—Prize of £4 to S. Polley, Copford. Highly commended, W. C. Kirkby, Weald Hall, Epping; commended, W. Parson, Boxted (Gye).

Two-year-old fillies.—First prize of £5 to G. D. Badham; second of £3 to G. D. Badham; commended, F. J. Cooper, Danbury.

Yearling colts.—First prize of £5 to R. B. Wingfield, Orsett Hall; second of £3 to D. Jackson, Chadwell-place, near Grays. Yearling fillies.—First prize of £5 to Sir T. B. Lennard; second of £3 to J. Way, Spayne's Hall, Great Yeldham.

Plough horses or mares.—Prize of £5 to W. Parson, Boxted (Smiler and Captain). Highly commended, J. Bray, Pyrgo Park, Havering; commended, W. C. Kirkby, Weald Hall, Epping.

Cart stallions.—Prize of £25 (open to all England) to C. Boby, Stutton.

Entire cart colts.—Prize of £10 (open to all England) to W. H. Walker, Wennington.

## RIDING AND COACHING HORSES.

Judges.—R. B. Aylmer, Westacre, Brandon.  
W. Hurrell, Newton, Cambs.  
H. Thurnall, Royston.

Thoroughbred stallions.—Prize of £15 to P. Portway, Great Sampford (Young Sultan).

Stallions, not thoroughbred.—Prize of £10 to J. Goggs, Baddow Park (Fire-away Shales).

Hunting mares.—Prize not awarded.

Hunting geldings.—Prize of £5 to J. Offin, The Park, Hutton (Baron).

Hackney mares.—First prize of £5 to J. S. Leecher, Boyle's Court, Brantwood (Merry Lads); second of £3 to E. Ind, Coomb Lodge, Great Warley. Commended, J. G. Fry, Hale End, Woodford.

Hackney geldings.—Prize of £5 to J. G. Fry, Hale End, Woodford (Taffy). Commended, D. C. Campbell, County Lunatic Asylum, Brentwood.

Brood mares with goals.—First prize of £8 to A. Francis, Colchester; second prize not awarded.

Ponies.—First prize of £4 to O. E. Coope, Rochette, Brentwood; second of £3 to G. D. Badham (Captain). Highly commended, W. Tasker, Walthamstow.

Thoroughbred Stallions.—Prize of £25, open to all England, Sir T. B. Lennard (Mainstone). Highly commended, Capt. Barlow, Hasketon, Woodbridge.

## CATTLE.

Judges.—W. H. Beauford, Bedford.

G. Garne, Chipping Norton.

J. Robinson, Clifton Pastures, Olney.

Pure-bred shorthorn bulls.—First prize of £15 to J. Bray (Prince Royal); second of £10 to J. Clayden (Marquis Cornwallis). Highly commended, T. W. Bramston, M.P. (Baron Roxwell); commended, C. Barnard, Harlow Bury, Harlow (Lord Gwyne).

Bulls of any other pure breed.—Prize of £5 to P. E. Bearblock, Hornchurch (Alderney).

Pure-bred two-year-old shorthorn bulls.—First prize of £10 to J. Christy, Roxwell (Potomac); second of £8 to J. Clayden (Lord Paramount).

Two-year-old bulls of any other pure breed.—Prize of £4 to Sir J. T. Tyrell (Alderney).

Yearling pure-bred shorthorn bulls.—First prize of £8 to J. Clayden (Belvidere); second of £4 to J. Clayden (Marquis of Bute). Commended, W. Belcher, Sandon (Garibaldi).

Pure-bred shorthorn cows.—First prize of £10 to D. McIntosh, Havering Park (Lady Bates); second of £8 to C. Sturgeon, South Ockenden Hall (Sweetbread). Commended, J. Clayden (Diadem).

Cows of any other pure breed.—Prize of £4 to H. Denne, Sible Hedingham (Alderney, Gam). Commended, H. Denne (Alderney).

Two-year-old pure bred shorthorn heifers.—First prize of £8 to R. Taylor, Hazeleigh Hall, Maldon (Gipsy Countess); second of £4 to R. Taylor (Fairy). Highly commended, J. Chaplin Ridgewell (Miss Western), J. Piggot (Clotilda); commended, J. Chaplin (Lady Western).

Two-year-old heifers of any other pure breed.—Prize of £3 to R. Stevens, Witham (Alderney).

Pure shorthorn yearling heifers.—First prize of £8 to J. Christy, jun. (White Dove); second of £4 to J. Christy, jun. (Fieldfare). Commended, J. Clayden (Rosa Gwynne).

Yearling heifers of any other pure breed.—Prize of £4 to C. Hill, Harrow Lodge, Hornchurch (Alderney).

Fat ox.—Prize of £5 to J. Upson, Rivenhall. Commended, T. W. Bramston, M.P.

Fat cows.—Prize of £5 to J. O. Parker.

Cows for dairy purposes.—First prize of £3 to W. Tippler, Roxwell (Spotty); second of £5 to J. W. Morris, Chigwell (Janet).

Heifers of a pure breed, not exceeding 12 months and not under 6 months old.—First prize of £5 to D. McIntosh (Princess 2nd); second of £3 to J. Piggot (Jannette). Highly commended, J. Upson, Rivenhall, and J. Christy, jun. (Pamela).

Pure-bred bulls not exceeding 12 months and not under 6 months. First prize of £5 to D. McIntosh (Grand Duke of Essex 2nd); second of £3 to J. Clayden (Archdale). Commended, C. Barnard, Harlow Bury (Charley Gwynne).

Pure-bred bulls.—Prize of £20, open to all England, to J. Bray (Prince Royal).

Shorthorn cows.—First prize of £8 to W. Swarder, Stapleford Tawney Hall; second of £4 to J. Upson.

Two-year-old shorthorn heifers.—First prize of £5 to Lieut.-Col. S. B. Ruggles, Brise, Spains Hall, Braintree; second of £3 to C. Hall, Princes Gate, Navestock.

Yearling shorthorn heifers.—First prize of £5 to W. Swarder; second of £3 to W. Swarder.

Shorthorn heifers not exceeding 12 months and not under 6 months. Prize of £3 to J. Giblin.

## SHEEP AND PIGS.

Judges.—E. Little, Landhill, Chippenham.

J. Waters, Eastbourne.

H. Woods, Merton, Thetford.

Southdown rams.—First prize of £5 to Sir T. B. Lennard; second of £3 to T. W. Bramston, M.P.

Rams of any other short-wooled breed.—First prize of £5 to D. K. Emson Westley's Wimbush (polled Norfolk); second of £3 to P. Portway, Great Sampford (Suffolk Down).

Cotswold rams.—First prize of £5 to J. Giblin; second of £3 to J. Giblin.

**Long-woolled rams of any age.**—Prizes not awarded, the class being of insufficient merit.

**Oxfordshire or Shropshire Down rams.**—First prize of £5 to J. Giblin (Oxford); second of £3 to D. Hicks, Naveslock (Shropshire).

**Shearling Southdown rams.**—First prize of £5 to Sir T. B. Lennard; second of £3 to Lord Braybrooke.

**Shearling short-woolled rams of any other breed.**—First prize of £5 to P. Portway, Great Sampford; second of £3 to P. Portway.

**Shearling Oxfordshire or Shropshire Down rams.**—First prize of £5 to J. A. Piggot (Oxford Downs).

**Shearling long-woolled rams.**—First prize of £5 to J. Giblin (Cotswold); second of £3 to J. Giblin (Cotswold).

**Shearling pure Down ewes.**—First prize of £5 to Sir T. B. Lennard; second of £4 to Sir T. B. Lennard.

**Shearling short-woolled ewes.**—First prize of £5 to J. Chaplin, Ridgwell (blackfaced); second of £3 to H. Moss, Bentley, Brentwood (Shropshire).

**Five shearling long-woolled ewes.**—First prize of £5 to D. Sewell, Beaumont Hall, Colchester; second of £3 to D. Jackson, Chadwell-place, Grays.

**Ewes and lambs.**—First prize of £5 to D. Sewell; second of £3 to H. Moss.

**Fat short-woolled wethers.**—First prize of £5 to Lord Braybrooke; second of £3 to Sir T. B. Lennard (Southdown).

**Fat cross-bred or long-woolled wethers.**—First prize of £5 to C. Squier, Field House, West Thorndon (cross-bred Kent and Shropshire); second of £3 to J. A. Piggot.

**Long-woolled rams.**—Prize of £10, open to all England, to H. Aylmer, West Dereham, Norfolk.

**Short-woolled rams.**—Prize of £10, open to all England, to Sir T. B. Lennard (Southdown).

**Boars.**—First prize of £5 to Sir T. B. Lennard; second of £3 to J. S. Leschar, Boyles Court, Brentwood.

**Boars not exceeding 13 months.**—First prize of £5 to G. D. Badham; second prize of £3 to G. D. Badham.

**Sows in-pig.**—First prize of £5 to G. Griggs, Romford (Princess); second of £3 to D. C. Campbell, County Lunatic Asylum, Brentwood.

**Sows with their pigs.**—First prize of £5 to G. D. Badham; second of £3 to D. C. Campbell.

**Three sow pigs.**—First prize of £5 to Sir T. B. Lennard; second prize of £3 to J. Giblin.

#### WOOL.

**Judges.**—T. P. Hitchcock, Lavenham.  
T. Johns, Chelmsford.

**Southdown wool.**—Prize of £3 to T. W. Bramston.

**Other short-wool.**—No entry.

**Long-wool.**—Prize of £3 to D. Sewell, Beaumont Hall, Colchester.

**Half-bred wool.**—Prize of £3 to C. Squier, West Hamdon (Kent and Shropshire Down teg).

**Merino wool.**—Prize of £3 to C. Sturgeon, South Ockendon Hall.

#### DONKEYS.

**Judges.**—W. P. Boghurst, Frating Abbey.  
J. F. Butler, Childerditch Hall.

**Male Donkeys.**—First prize of £2 2s. to W. Bott, Broomfield; second of £1 to J. Emery, Tollashunt D'Arcy.

**Mare Donkeys.**—First prize of £1 10s. to H. Foyster, Brintree; second of 10s. to G. Fairchild, Broomfield.

#### BRENTWOOD TOWN PRIZES.

**Cart Mares.**—Prize of £10, open to all England, to J. Ward, East Mersea. Highly commended, W. Parson, Boxted (Diamond); commended, G. Tomline, M.P., Nacton, Ipswich (Darby).

**Cart Fillies.**—Prize of £5, open to all England, to J. Ward. Very highly commended, G. Tomline, M.P. by Canterbury Pilgrim.

**Shearling long-woolled Ewes.**—Prize of £5, open to all England, to D. Sewell.

**Shearling Kent Ewes.**—Prize of £5, open to all England, to D. Jackson, Chadwell Place, near Grays.

**Shearling short-woolled Ewes.**—Prize of £5, open to all England, to Sir T. B. Lennard (Southdown). Very highly commended, C. Howard, Biddenham, Beds. (Oxford Down); T. W. Bramston, M.P., and Lord Braybrooke.

**Black Boars.**—Prize of £5, open to all England, to G. M. Sexton, Wharfedale, Ipswich. Commended, S. G. Stewar, Brandon; and G. M. Sexton.

**White Boars.**—Prize of £5, to G. M. Sexton. Commended, G. M. Sexton (sire The Clipper).

**Weight-carrying Hunting Mares or Geldings.**—Prize of £10, open to all England, to J. Offin (Baron). Highly commended, the Hon. F. Petre.

Financially the show must have been a success. Between 7,000 and 8,000 visitors entered the yard, and the sum taken at the gates was £348 13s. 1d., or about £80 more than was realized from admission fees at Harwich last year. A poultry show and a horticultural exhibition also attracted large numbers of visitors during the day. These latter festivities—or as the French have it, "solemnities"—were unconnected with the Society, but were highly successful *amusees*.

## NORTH HANTS AGRICULTURAL SOCIETY.

### MEETING AT WINCHESTER.

#### AWARDS OF THE JUDGES.

##### HAMPSHIRE DOWN SHEEP.

**Judges:** G. Butler, Tufton.  
W. Humfrey, Chaddlesworth,  
T. Saunders, Watercombe.

**Ewe Tegs, not having been separated from the flock.**—1st prize, a cup, value £7 10s., the Earl of Uxbridge. 2nd, £2 10s., John Palmer, Cliddesden. Highly commended, the Earl of Uxbridge and J. Palmer.

**Ewe Tegs, having been separated from the flock.**—1st prize, £3, the Earl of Uxbridge.

**Ewes of any age.**—1st prize, £4; 2nd, £3; 3rd, £1; the Earl of Uxbridge. Highly commended, A. Clark, Charity Farm, Fareham.

**Rams of any age.**—1st prize, £5 5s., E. Olding, Ratfin Farm, Amesbury. 2nd, £3 10s., Messrs. J. and M. Arnold, Westmeon. 3rd, £1 10s., W. Spencer, Barton Stacey, Stockbridge.

##### HAMPSHIRE OR WEST-COUNTRY DOWN SHEEP.

**Shearling Rams.**—1st prize, a cup value £10 10s., W. Spencer, Barton Stacey. 2nd, £5, J. Rawlence, Bullbridge, Salisbury. 3rd, £3, E. Olding, Amesbury. Highly commended, Messrs. J. and M. Arnold, Westmeon; James Rawlence, Bullbridge. Commended, C. Child, Lower Wyke, Andover.

**Ram Lambs.**—1st prize, £4, W. Spencer, Barton Stacey. 2nd, £3, E. Olding, Amesbury. Highly commended, L. Lewis, Chilton, Candover; Geo. Edney, Whitchurch; and John Barton, Hackwood Farm.

**Ewe Lambs.**—1st prize, £2, the Earl of Uxbridge. 2nd, £1, G. K. Budd, Cliddesden. Highly commended, the Earl of Uxbridge.

##### SHEEP OF ANY OTHER BREED.

**Rams of any age.**—1st prize, £5, T. Beale Brown, Salperton Park, Andoversford, Gloucestershire. 2nd, £2, R. Butler, Forton Farm, Longparish.

**Shearling Rams.**—1st prize, £3, T. Beale Brown, Salperton Park, Andoversford.

**Ram Lambs.**—1st prize, £3, Robert Barrett, Pobbly Field Farm, Sherborne St. John. 2nd, £1 10s., Messrs. H. and C. Portsmouth, Basingstoke.

**Ewe Lambs.**—1st prize, £3, Robert Barrett, Pobbly Field Farm, Sherborne St. John. 2nd, £1 10s., Messrs. H. and C. Portsmouth, Basingstoke.

**Fat Stock, Ten Fat Lambs.**—Prize £2 10s., G. K. Budd, Cliddesden. Highly commended, Messrs. H. and C. Portsmouth, Basingstoke; Robt. Barrett, Pobbly Field Farm, Sherborne St. John.

**Ten Fat Sheep.**—Prize, £2 10s., Messrs. H. and C. Portsmouth, Basingstoke.

##### CART HORSES.

**Judges:** J. B. Spearing, Oxford.  
W. C. Spooner, Kiling, Southampton.  
Mr. Jas. White, Odham.

**Stallions.**—Prize, a cup value £6, Rev. Stephen Terry, Daumer.

**Two-year-old Stallions.**—Prize, £5, George Butler, Sherborne St. John.

Mare and Foal.—1st prize, £5, E. Cobden, Preston, Cadoxes. 2nd, £3, Rev. S. Terry, Dummer.

Mare—Prize, £3, L. Lewis, Chilton, Cadoxes; extra prize, £1, W. Attwater, Freefolk Manor. Highly commended, the Earl of Uxbridge.

Three-year-old Filly.—Prize, £3, W. S. Portal, Malahanger Park.

Two-year-old Filly.—Prize, £3, Thomas Baring, M.P., Norman Court Farm, Stookbridge. Highly commended, Rev. S. Terry, Dummer, and W. S. Pitt, Littleton.

#### BULLS AND COWS.

##### JUDGES AS FOR HORSES.

Bull of any breed.—1st prize, a cup value £5 5s., W. W. Champion, Calcot, Reading. 2nd, £3 10s., D. Smith, Browning Hill, Baughurst.

Two-year-old Bull.—1st prize, £3, W. W. Champion, Calcot, Reading. 2nd, £3, Rev. S. Terry, Dummer.

Yearling Bull.—1st prize, £3, W. Bristow, Broxmore Park, Romsey. 2nd, £1, W. W. Champion.

Cow-in-milk, of any breed.—1st and 2nd prizes, £4 and £3, W. W. Champion, Calcot, Reading. Highly commended, Captain G. C. Fowler, Crookham End House, Newbury.

Heifer, under three years old.—1st and 2nd prizes, £3 and £2, W. W. Champion, Calcot, Reading.

Heifer, under two years old.—1st and 2nd prizes, £2 and £1, W. W. Champion.

#### PIGS.

##### JUDGES AS FOR HORSES.

Boar of any breed.—1st prize, a cup, value £3 3s., G. Bridger, New Barton Farm, Winchester. 2nd, £1 10s., W. A. Box, Farleigh, Basingstoke.

Berkshire Boar.—1st prize, £3, W. W. Champion, Calcot, Reading. 2nd, £1 10s., W. Butler, Whitechurch.

Berkshire Breeding Sow.—1st prize, £3, Rev. S. Terry, Dummer. 2nd, £1 10s., Rev. H. Bailey, Vicarage, Swindon.

Sow of any other breed.—1st prize, £3, W. A. Box, Farleigh. 2nd, £1 10s., Capt. R. P. Warren, Worting. Highly commended, T. Chamberlayne, Cranbury Park. Commended, Mr. W. Wellock, Basing.

## ROYAL AGRICULTURAL BENEVOLENT INSTITUTION.

The fifth anniversary festival of this institution was celebrated Wednesday evening, July 7, at the London Tavern, about one hundred gentlemen being present. The chair was taken by the president of the council, Earl Spencer; and the company included Lieutenant-colonel Loyd Lindsay, Lieutenant-colonel Sir Charles Russell, Alderman Mechi, Mr. John Hudson, of Castleacre, Mr. Cantrell, Mr. James Crispe, Mr. J. Baldwin, Mr. R. Garrett, Mr. Druce, Mr. J. Collins, Mr. Shackell, Mr. H. Corbet.

After the usual loyal toasts, the Chairman proposed the "Army, Navy, and Volunteers," and, in doing so, observed that it was rarely that that toast was associated, as it was on that occasion, with the names of two possessors of the Victoria Cross—Lieutenant-colonel Sir Charles Russell and Lieutenant-colonel Loyd Lindsay. These gallant officers having returned thanks, the former for the army and the latter for the volunteers.

The CHAIRMAN, in proposing "Success to the Institution," commenced by alluding to the speeches delivered from the chair in connection with the same toast at previous anniversaries—speeches which, he said, contained principles that ought to regulate the affairs, and secure the prosperity of the Institution for all time. He felt the difficulty of following such chairmen as Mr. Disraeli and Lord Stanley; but, having accepted the task, he must do his best to perform it (cheers). It seemed very strange that, till the year 1860, the great agricultural interest of this country should have possessed no benevolent association. Almost every occupation had its association for the benefit of such of its members as might be overtaken by misfortune; but almost all institutions of that kind belonged to towns. He need scarcely say that the inhabitants of towns, meeting together as they did very frequently, knew each other's wants and the wants of the different classes who composed the community. On the other hand, up to a very recent period, farmers seldom met, except on market day, when their minds were intent on business, and too much occupied with other matters to attend to the claims of benevolence. The spread of railways, however, which have done so much good in various ways, had produced a favourable change in this respect; and town and country having, as it were, met together more frequently, the latter had benefited by intercourse with the former. Hence, it came about that this institution was started by Alderman Mechi, for the benefit of agriculturists (cheers). The worthy Alderman's experience among the charities of the metropolis led him to this conclusion—that an institution of this kind was needed for agriculture (cheers). It would be perfectly ridiculous to say that farmers did not require such an institution. To affirm that would be to say that they were not subject to misfortune like other people; whereas, they all knew that that was far from being the case (Hear, hear). The farmer might have his fortune wrecked by the failure of a bank, by becoming security for a near relation, or by some other external cause. Moreover, there was no business, perhaps, in which sickness on the part of the head of the family produced more disastrous effects; for farming required the utmost personal attention; and, if it was precluded this, it was very difficult to carry on the operations of the farm successfully. The farmer was, too, entirely dependent on his crops and his stock; and the one might, within a few hours, be almost entirely destroyed by storms, and the other carried off by disease, spreading with the utmost rapidity, in consequence of the carelessness of railway officials (Hear, hear). All these things made the occupation of farming very precarious; and, therefore, they must expect to hear of many who had been reduced to distress without any fault on their own part. This institution was one which ought to command the support of every farmer in this country. And he could not doubt that it would do so; for there was no class of men who sympathised more with each other than farmers, and none whose purses were more open to relieve any case of distress connected with their own calling. Even supposing that many of them were not likely ever to want assistance, surely it would be a noble thing to have assisted by means of that institution those who had been less fortunate than themselves? (cheers). He wished now to say a few words about the management of the society. They were all aware that there were three classes of persons who received relief out of the funds of that society—namely, single pensioners, married couples, and widows. To those he might add orphans, of whom there was only one on the pension list at that moment. Among the expenses of many of their charitable societies, there were large items under the head of buildings; the only expense of that kind in this case was the rent of the first floor, which formed the office of the society, in Charing Cross. Hence, nearly all the funds of the society were available for direct assistance; and he believed the payment of pensions was far more satisfactory to the class assisted than would be a compulsory residence in one building, as there was no interference with those habits of independence, or those social relations to which farmers and farmers' wives were so much attached

(cheers). Within the last year, and since he had the honour of being elected Chairman of the Council, an important change had been made with regard to the pensions. Formerly, when a husband who was in the receipt of £40 a year died, his widow at once lost the whole of the pension. That operated in some cases very hardly; and hence it was determined that, in a case of that kind, the widow of the deceased pensioner should receive £10 a year for three years, in order that she might have time to obtain a permanent pension for herself, or otherwise to adapt herself to her new position (Hear, hear). That arrangement would, he was sure, be approved by the members generally. There was one other point connected with the administration of the funds to which he wished to allude, and which he thought worthy of the consideration of the Council and the society. He had often observed in reference to charities that individuals who were in great distress, and most deserving of assistance, were on the list of candidates time after time; and, from the fact of their being in such distress, were unable to raise money to pay the expense of securing votes. Now, he thought it was worthy of consideration whether, in order to meet some cases of that kind, it might not be desirable to allow a certain proportion—he did not say a large proportion—of the candidates to be elected, he would not say by the Council, but by some body of persons acting out of the ordinary way. There were, he believed, most deserving cases of persons who, for want of friends or of funds, were unable to secure a participation in the advantages of the institution (Hear, hear). He believed he might congratulate the company assembled on the prosperous state of the institution. The annual subscriptions were very largely increasing, as were also the donations. He thought it desirable that the latter should be funded as far as possible, in order to afford additional security for the continuance of the pensions. As regarded the education of orphans, he thought it was desirable to wait till the institution should be in a better position for undertaking such an important work. In conclusion, he would observe that, according to the Census of 1861, the number of farmers and graziers at that time living in this country was 250,000. The subscriptions to the society amounted only to 4d. per head for the whole number; whereas, if they were increased to a shilling a head, there would be an income from that source of £12,500 per annum (Hear, hear). He could not sit down without paying a tribute to the excellent secretary of the society, Mr. Shaw, to whom the institution was in a very great degree indebted for its present state of prosperity.

The toast was drunk with great cordiality.

The secretary, Mr. CHARLES SHAW, then read the list of subscriptions connected with the anniversary, which included the following: Her Majesty the Queen £25, Lord Spencer £25, Lieutenant-Colonel Sir Charles Russell £5 5s., Lieutenant-Colonel Lloyd Lindsay £25, E. J. Coleman £21, Hon. G. W. Fitzwilliam £5 5s., Lord Kilmorey £5 5s., John Dobede Taylor £5 5s., Thomas Philpott £10 10s., Sir Edward Kerrison £26 5s., Lord Henniker £10 10s., Lord Stradbroke £26 5s., Lady Elizabeth Dashwood £5 5s., Lewis Loyd £10 10s., Charles Lake £10 10s., C. Comfort £5 5s., G. Savill £5 5s., A. H. Bailly £5 5s., John Collins (sixth donation) £10 10s., F. Grimmer £5 5s., John Hill £5 5s., C. Game £2, G. Hill £5 5s., J. and F. Howard £24 2s., Frederick Gill £37 16s., John Mills £21 10s. 6d., George Shackel £28 17s. 6d., William Sharp £23 12s. 6d., C. S. Cantrell £150 13s. 6d., J. Leete £22 1s., F. T. Monkhouse £12 12s., J. S. Warrington £9 19s. 6d., Harriess Long £97 18s., J. O. Chislett £22 1s., W. H. Alger £36 15s., Mr. Alderman Mechi £93 2s. 6d., W. Vivian £37 16s., David Archer £21, J. Clayden £120 15s., Stephen Green £6 16s. 6d., Joseph Lawrence £42 10s. 6d., William Matson £51 9s., Edward Mead £7 17s. 6d., W. Symonds £8 8s., Charles King £16 16s., Frederick Roach £80 12s., John Naish £233 10s. 6d., J. B. Brandram £29 18s. 6d., C. Dorrington £12 12s., William Heard £6 6s., John Weall £13 13s., George Webb £21 10s. 6d., F. Batcock £9 19s. 6d., John Hall £29 18s. 6d., Robert Allen £23 12s. 6d., W. Delves £5 5s., Wm. Mercer £35 2s. 6d., Mark Sandford £3 3s., J. S.

Swinford £24 3s. 6d., W. E. Hobson £23 2s. 6d., T. H. Bland £27 16s. 6d., R. H. Chapman £5 5s., Peter Colston £24 3s., John Collins £97 17s. 6d., A. H. Johnson £67 4s., F. Sherborn £54 12s., F. Grimmer £64 7s., J. M. Hudson £111 16s., James Reeve £7 17s. 6d., John Marriott £24 3s., E. Wortley £116 0s. 6d., E. Lowe £13 13s., Richard Garrett £160 5s. 6d., John Fletcher £9 19s. 6d., T. B. La Coste £15 18s., Thomas Humpidge £32 11s., R. J. Lidgold £14 14s., E. Hicks £10 10s., George Jenner £39 18s., J. Bayzand £14 3s. 6d., J. Bromwich £12 1s. 6d., J. S. Lees £5 5s., J. Palmer £120 16s., with other small sums, making a total of £3,322. Mr. Shaw also read the following statement: "Referring to the first election of pensioners, in 1861, it will be remembered that £455 was appropriated to the maintenance of twenty pensioners. At the second election, in 1862, £264 was voted for thirteen additional pensioners; at the third election, in 1863, a further sum of £284, for the support of thirteen more pensioners; and in 1864, at the last election, £304 was ordered by the council, for the relief of fourteen additional pensioners, making up the total number to sixty, and the total expenditure to £1,326. The former figure has, by deaths, been since reduced to forty-nine, and the total expenditure to £1,052. The financial progress of the institution must be considered highly satisfactory. The donations amounted to £1,143 13s., being £379 13s. in excess of last year; and the annual subscriptions reached £2,944 3s. 6d., being an increase of £620 12s. In addition to the balance of £725 14s. 11d. from last audit, a legacy of £100, bequeathed by the late Mrs. Lamprell, of Leigh, Essex, has been received, which, together with £25 15s. from dividends, make the total receipts of the year £5,046 7s. 8d., of which £2,707 10s. have been devoted to the purchase of stock, leaving a credit balance at the bankers of £655 1s. 4d."

Lieut-Col. LOYD LINDSAY, in proposing the health of the noble chairman, said his lordship was no doubt well known to many guests as the master of the Pytchley hounds, and in that capacity he had earned universal esteem and regard in the district; but on that occasion his object was to assist an institution which provided for the alleviation of the sorrows of those who had been unfortunate as farmers, at a time of life when they were unfitted to struggle against calamity. His lordship had spoken with diffidence when alluding to his predecessors in the chair; but, certainly, neither of them had touched the heart with a more earnest appeal (cheers). They all knew that pedigree was a very important thing, and his lordship's pedigree was one which naturally led agriculturists to expect the interest which he manifested in all that concerned their welfare (loud cheers).

After the toast had been heartily drunk,

The CHAIRMAN briefly returned thanks.

Alderman MECHE proposed "The Agricultural Societies of England, Scotland, and Ireland;" to which Mr. John Hudson, of Castleacre, responded.

The next toast, namely, "The Executive Council," was proposed by Mr. John Clayden, and acknowledged by the vice-president of the council, Mr. Charles Cantrell.

"The Stewards," which was proposed from the chair, was responded to by Mr. Richard Garrett.

The CHAIRMAN proposed, in eulogistic terms, the health of the secretary, Mr. Shaw, which was cordially received.

Mr. SHAW, in returning thanks, observed that he could do very little in Charing Cross, were it not for the powerful assistance which he received from the honorary local secretaries scattered throughout the country, who were most energetic in collecting subscriptions for the society.

The CHAIRMAN having afterwards proposed "The Ladies," the company separated.

The musical arrangements were under the direction of Mr. G. Perren, who was ably assisted by Miss Anna Hiles, Miss Julia Elton. Mr. T. Lawler, Mr. J. L. Halton, and Mr. G. J. Patey. Mr. Barker was the toastmaster.



## MIDLAND FARMERS' CLUB.

## THE SEWAGE OF TOWNS.

A general meeting of the Midland Farmers' Club was held in the Philosophical Institution, Birmingham. Mr. R. Chawner presided.

Mr. HOUGHTON in his paper said: A great deal has been said, and a great deal has been written, on what has been called the "Great Sewage Question," by a great number of individuals who have no practical knowledge of the subject on which they speak and write. I shall be as precise as possible, in order that there may be no mistake as to the issue intended to be raised by the resolutions which I shall submit for the approval of the members of this Club. Since commencing this paper, I have been told that there is no necessity for enforcing the opinions I advocate, as the public mind is made up upon the point, and that the question may be so far considered as settled. How this can be the case, when the authorities of the great metropolis and the authorities of this little metropolis of the Midland Counties are respectively endeavouring to obtain the sanction of Parliament and the support of Government to plans for the utilization of sewage, on the assumption that the utilization of sewage is synonymous with the utilization of the manure which has been run into the sewers, I cannot see or understand, and the more especially as almost the last clause of the last report of the Royal Commission recommends the continuance of the present pernicious system on a more extended scale for passing cesspool matter into the common sewers. Rather more than a quarter of a century ago, Peruvian guano, a very powerful fertilizer for light soils, began to be used in this country; and from a very small beginning, the demand has increased until the consumption amounts at the present moment, according to the evidence of Professor Way, to something like 200,000 tons annually: Baron Liebig says 400,000, but I prefer taking Professor Way's estimate, if for no other reason, yet for this—that I intend to keep under the facts rather than overstate them, in the argument I am about to enforce. About the same time Baron Liebig brought into notice a new principle for breaking down the substance of bone, by the use of sulphuric acid, and forming the manure called superphosphate, of which article the consumption is estimated by the same authority at not less than 150,000 tons annually; £240,000 worth of these bones come from abroad, and then there are a variety of the chemical manures, so that altogether it may be calculated with the most perfect safety that the British farmer pays to the foreigner in hard cash not less than £3,000,000 per annum for artificial manure. Commencing about the same period, and running contemporaneously with the exertions of the British farmer to obtain supplies of manure, to enable him to compete with the lighter-taxed produce of other countries, the authorities of our large cities and towns adopted and carried out a system of draining a great portion of their town manure into the common sewers, until they have succeeded in depriving the British farmer of an available amount of home manure, equal at least in value to that for which he is now paying in hard cash to the foreigner. The Royal Commission of 1858 and the Parliamentary Committees of 1862 and 1864 agree in a remarkable manner in coming to conclusions opposed to the evidence brought before them. They all, however, agree in encouraging one leading idea—viz., that the way to return to the land the manurial matters arising from the consumption by the population of towns of the bread, beef, beer, and other articles of food raised on it, is to pass such manurial matters into the common sewers, and then use such sewage upon the land. I purpose dealing chiefly with the report of the last-named Committee, which had the effect of setting the Corporation of London and the Board of Works of that city by the ears, and of eliciting an opinion from Baron Liebig that a new system of agriculture was about to be inaugurated, which would revolutionize our present ideas of farming, and to which English farmers would have to serve an apprenticeship, the learned Baron having himself magnanimously proposed to give up his lucrative German professorship, and, in his old age,

take up his residence in London, in order the more effectually to facilitate this very desirable consummation. Many of our great landed proprietors, taken up with the exaggerated idea of the value of sewage, also came forward with an offer of their estates for the purpose of these grand experiments, without the slightest reference to the opinions or wishes of the tenants at present upon them. The resolutions of Lord Robert Montague's Committee, which more particularly bear upon the present question, are the 5th and the 16th. The 5th reads thus: "The amount of artificial manure is even at present insufficient; and the sources whence some of the most important are obtained will in a few years be exhausted. Other means of fertilizing the land must therefore be resorted to." On the principle, I suppose, that "the exception proves the rule," this resolution happens to be strictly in accordance with the evidence on which it professes to be founded. Farmers have the truth of the statement convincingly brought home to them in the price of artificial manures; guano, which in a considerable degree regulates the price of other fertilizers, having advanced from £8 per ton to between £13 and £14 per ton, fully admitting the fact here recorded. We now come to the other means of fertilizing the land, which appears to be argued out at resolution No. 16, which says: "The removal of home refuse to the land would now be much easier and cheaper than it was formerly, because carriage by suspension in a liquid is the cheapest mode of transport." Farmers have to consider something else besides what is the cheapest and easiest. With them the question is, which is the *best* mode of transport? To illustrate the absurdity of the idea, take the case of London, with its population of three millions. The scheme of Messrs. Napier and Hope proposes to apply the sewage of that city, which contains also the manure derived from its inhabitants, to ten thousand acres of land, with outlets for thirty or forty thousand acres more on the road, if the farmers will take it. Say fifty thousand acres more for that portion of London sewage which Messrs. Napier and Hope do not deal with: one hundred thousand acres altogether. A very improbable quantity, because if the stream were large enough to irrigate one thousand acres per day, and the sewage allowed to remain one day and night only at a time, it would make a difference of 100 days between the irrigation of the first portion of land and the last. If the first thousand acres had the sewage-water by the middle of February, the last would get it by the middle of May—a month after the first crop ought to be cut or eaten off, to be of any special value. But suppose this little difficulty to be overcome, and that one hundred thousand acres could be properly irrigated at the proper time, cow-keep enough would be produced to feed a number of cows sufficient to supply the greater portion of London with milk, without adopting the popular principle of "suspending" any portion of it in a liquid. Now, London people do not live at present exclusively on a milk diet. They require something like 3,000,000 quarters of wheat; the Chancellor of the Exchequer says 3,000,000 barrels of beer also, supposed to be made from home-grown barley. In addition to these there is every description of meat, vegetables, butter, cheese, and a great variety of other articles. According to the present state of the cultivation of land in England, 3,000,000 acres would not supply all these various items of food. Does it not, then, appear perfectly absurd and ridiculous to talk, by such means as these, of returning to the land the elements of fertility which have been removed in the crops by applying the sewage manure or manured sewage to 50,000 or 100,000 acres of grass land? And to do what? Why, as far as has at present been ascertained, to effect what sewage proper—that is, street-drainage, soap-suds, and dish-water—will do alone. At all events, this much may be taken for certain, that the sewage of each town is sufficient, if every particle of manure were kept out of it, to supply such town with as much of the peculiar kind of food it is capable of producing, which every such town can possibly require. I wish to guard myself against being supposed



to say a single word against the utilization of the sewage of London, and the consequent purification of the Thames. I hope the land it is proposed to deal with, the dingy flats or dismal swamps, will be as fit for the purpose as that of Edinburgh, and that it will return a fair per-centage to the shareholders of the scheme. This I will venture to assert: If the Corporation of the City of London permit the sewage to be absolutely disposed of without any reservation of the night-soil and urine contained in it, and thereby bar themselves from any advantage that may result from the application of science to this article, when a demand arises for it, as it seems must inevitably be the case before long, they will have made a mistake, not only affecting themselves but entailing a great national loss. I cannot well pass over this part of the subject without noticing the very alarming letters written by Baron Liebig to the Corporation of the City of London and Mr. Alderman Mechi. To notice every point in those mystified and contradictory communications would take up too much of the time allowed me. How the application, for instance, of any amount of superphosphate to the sewage, or to the land to be treated with, can possibly meet the objections I have stated in this paper, I must leave the learned Baron, or some one for him, to answer, and proceed to the very alarming statement that the agriculture of Great Britain is going down-hill headlong. "It is stated a great part of the manure arising from the consumption of the food supplied to the inhabitants of our large cities and towns is at present wasted." I will aid this part of the Baron's argument by adding that such waste proceeds from the consumption of not less than 6,000,000 of human beings, and is intrinsically worth at least £3,000,000 per annum. This is, undoubtedly, a very great fact. Next, "Unless these elements of fertility are returned to the land on which the food is grown, such land must decrease in value, and ultimately become sterile." This is another fact. Now for the argument deduced from these two facts—*ergo*, the land of England must be declining in fertility, and, as a necessary consequence, the power of England must decline with it. The great fact in connection with the conclusion of the argument is that it is a great mistake, for the simple reason that what is wasted is only about equal in amount to what is imported from abroad in exchange for our mineral productions, and the labour expended in manufactured articles. The land that is exhausted is the land from which the food is derived, such as the old States in America, which are now, like ourselves, drawing a great portion of their supplies from the same quarter that we do some of ours—the boundless and apparently almost exhaustless prairies of the far West, at present undergoing the process of exhaustion. America is not a great wheat-growing country, after all. So far from the land of England deteriorating in fertility, it ought to be improving, because the farmers, in addition to all the home manure they can obtain, expend £3,000,000 per annum, or more, in foreign manures; and with reference to that portion which is applied to the growth of turnips, it must be remembered that the latter crop, when grown, is again in many instances doubled by the importation of *foreign cake, corn, &c.*, supplied to the stock which consumes the turnips. Undoubtedly, if the enormous waste which is now going on in the towns were economized, and applied to the land, and at the same time measures were taken to secure to the tenant-farmer the result of his skill and capital, both the fertility and the productive powers of the country would *enormously increase*, and we might then be able to obtain wholesome English meat at fair and moderate prices. There is one more view of the question. You must use sewage manure in one of two ways: either by application to grass land by irrigation, or to grass and arable land in smaller quantities for the sake of the manure suspended in it. In the first case you are met by the fact that the more grass you grow the coarser it becomes, and consequently the application must be very much limited to the production of one article only, *viz.*, milk; and you are limited also to the quantity of land to which it can be applied by the size of the stream. If an attempt is made to apply it to arable or grass lands in smaller quantities, the difficulty that meets you, irrespective of the cost of applying it, is this: when you want the water most it is itself worth a deal more than the manure in it; and when you want the manure only, the water becomes an encumbrance. Farmers will never buy the manured water by the ton. A kind Providence provides them with an average of 3,000 tons per acre free of cost or carriage.

I contend, therefore, that the second part of the proposed resolution is established beyond all question. Of the first part little requires to be said. It is a fact that the sewage of Milan (where the privy manure is rigidly excluded and separately used) has increased the value of the irrigated land round the city by from £4 to £5 an acre; and at Edinburgh equal or greater results were obtained before a single water-closet was drained into the sewers. It is so wherever it is used, and the more soap-suds it contains the more is the grass forced forward in the spring. One more point before quitting this part of the subject. In the *Blue Book* of the statistics of Norfolk and Hants, from the reports of Sir John Waltham and Mr. Hawley, it appears that the cultivated land in these two counties, for which returns were made, amounted to 1,614,490 acres, and the stock of all kinds on these lands was ascertained to be 1,529,728, not quite one head of cattle per acre. Now, for the sake of argument, I am going to suppose something wild and very improbable. Suppose the whole of this stock was kept in covered sheds, on the plan adopted by the Rev. Mr. Huxtable, in Dorsetshire, and that in order to get rid of the smell arising from the manure the streams near at hand were run through all the homesteads into the rivers, and that in this manner something like 150,000 acres already irrigated were treated with manure in this form, what would be the inevitable result? The lands which grew the crops from which the manure was derived would most inevitably go out of cultivation, the price of meat would be increased enormously, and a cry would be raised that both farmers and landowners were gone stark staring mad. Now, wild as this idea would be if carried out, in what respect does it differ from the plan at present in existence in our large cities and towns, which are expected to produce such astonishing results by those gentlemen who have the management of it. The fact is, instead of the revolution which has been spoken of in our present system of farming, in order to meet the modern requirements of town sewage, what we want is a radical change, and a complete revolution in the management of town manure itself in order to supply those other means of fertilizing the lands of this country alluded to in Lord Robert Montagu's resolution No. 16. Thus to meet the necessities of the large turnip-growers it must be in the form of a dry, portable, highly-concentrated manure (capable of competing with guano). I offered at that time, if the Public Works Committee would find land suitable for the purpose, to conduct experiments at my own cost, with the view of proving that clear unadulterated night-soil and urine were worth delivered £1 per ton, a price, if it could be once realised, which would not only pay for the cost of collecting, but leave a handsome surplus towards meeting local taxation. The paper then referred more particularly to the local sewage of Birmingham, after which Mr. Houghton said: "The really great question was the collection and utilization of privy and water-closet manure, in order to make good the deficiency of artificial manures pointed out in Lord R. Montagu's resolution before referred to. Having been asked four years ago by Mr. Lloyd (then mayor) to give my attention to the subject, I have arrived at the conclusion that this is possible to be done, and I now again for the purpose of testing it offer to any manufacturer or private gentleman £1 per ton for the manure under consideration in its raw state, and I will then put it into a dry portable form, and invite any farmer present to try it in competition with the best known fertilizers in use for root crops." Mr. Houghton concluded by moving the following resolution: "That the sewage of towns has long been utilized and may continue so to be, with more or less advantage, to those places where it is produced, according as land can be found suitable and easily accessible for using it upon; but the idea that night-soil or any other manure, diluted to the extent that it must necessarily be in town sewage, can be of any use to farmers in that state, is an erroneous one, and the practice of so disposing of it entails an immense loss to the country of valuable fertilizing materials."

Mr. KING seconded the resolution.

Mr. BANNER then read his paper. In the outset he referred to the evils of the present closet and sewage system. Noxious gases are discharged into dwelling-houses from the closets, and into the streets through the ventilating openings in the sewers. Springs are polluted as well as rivers and streams. The exhalations from sewers and closets must be the cause of great injury to the health of townspeople, and he

believed that fevers and epidemics were caused by those exhalations. Sewage contained all the elements of valuable manure; but he thought that sewage itself, as discharged from towns, if applied to land, might produce disease in cattle. The problem, then, was to obtain the valuable manurial matter separate from the sewage. He did not believe that farmers would use the sewage itself. It would only turn their farms into puddles. They might use some of it in dry weather; but it would be most plentiful in wet weather, when not required. Besides, how could the sewage be disposed of in frosty weather, when it could not possibly be applied to the land? It was plain that town sewage could not be advantageously applied to land. He then reverted to the question how the manurial matter now mixed with and wasted by means of town sewage could be obtained for separate use. He would have the urine collected in pipes, as it is in towns where the woollen manufactures are carried on. There should be proper precautions taken to prevent the diffusion of gases; and as a liquid manure would not be so marketable as a dry concentrated powder, like guano, he would have the liquid collected at suitable works, there to undergo decomposition, being so treated that the ammonia would be retained. The aqueous matter would be evaporated, and a dry concentrated manure would remain. As to the fecal matter, by means of mechanical arrangements which he submitted to the meeting he would intercept it—not allowing it to pass into the sewers, but retaining it in dry closets; and he would destroy its offensive character by having a deodorant deposited by an automatic apparatus. He believed these plans might be carried out with profit in a commercial sense, and with benefit in a sanitary point of view.

The CHAIRMAN suggested that as the subject of the papers was most interesting and of great importance to the town and the country generally, before it was taken up in its various details it would be advisable that the discussion should be adjourned. In the meantime, the opinions of practical men might be taken upon the suggestions made in the various papers. He, therefore, suggested that the discussion should be adjourned.

Mr. H. WIGGIN (the Mayor) said he very much agreed with the remarks that had been made in the papers that had been read by the two gentlemen. He had been much interested in the papers, and also in the models exhibited by Mr. Bannehr. He regretted, however, that he had not learned from them any practical suggestions as to the utilization of the sewage of towns (Hear, hear). He was in hopes that they would have dealt fully and practically with the question. It was well known now that the sewage matter of towns possessed very valuable manurial properties. In the town of Birmingham they had about fifty or sixty tons of sewage matter per day, which was thrown into the river Thames. What they wanted to know from their agricultural friends was as to how they were to utilize that sewage which they were annually pouring into the river Thames, and make it return a goodly sum annually to the Corporation. If the Farmers' Club could solve that question they would not only do good for Birmingham, but for the country generally. That was the great problem they had to solve. Mr. Houghton had referred to an apparatus the same as one which he had adopted by his own manufactory, where he employed about one hundred and fifty men. If they were prepared to give him £20 per year for the sewage he should be glad to accept it, and he believed that if the agriculturists were prepared to offer the authorities of the town 5s. to 6s. per ton for the sewage of the town it would be accepted. What they had to contend with in Birmingham was this, that they had fifty to sixty thousand tons of sewage matter per day. Sir Robert Montagu had brought in a bill allowing local authorities to deal with their sewage, and utilize it as they thought proper, and also to carry it out of the town. The corporation had done so, and Mr. Addeley had threatened them with an injunction for taking the sewage matter into the river Thames. They had also met with other difficulties, and if it could only be shown how they could carry the sewage to the farmers, and also to properly utilize it, a great benefit would be conferred upon the farmers, and also upon the inhabitants of the town. There was no doubt that a great deal of sewage was wasted in the town, and what the corporation wanted to know was how it was to be conveyed to the farmers so as to be of use to them. This was the difficulty which the members of the club had to solve. As to the separation of the matter, he did not agree with the previous speakers. Supposing they

took from the sewage the matter issuing from seven or eight thousand water-closets in Birmingham, there was an enormous quantity of matter got into the sewers from the refuse of manufactories, the sweeping of the streets, and other places. He considered that the manurial value of the sewage would not be more than 2s. per ton, as its market value. There was even some difficulty in getting rid of it at that price. All he could say was that if the gentlemen present could promise them the same price for the sewage matter as they promised them now, the corporation would have no objection to see the suggestions of the readers of the papers carried out.

Mr. HOUGHTON said he should at the next meeting answer the remarks of the mayor.

Mr. CHESHIRE said it could not be denied that the existing sewage system was destructive of the health of the people. The only remedy was to intercept the solid matter—not allowing it to get into the sewers at all. The public health would then improve, and farmers might be supplied with a valuable manure.

Mr. JOHN LOWE said it was a great mistake to carry the contents of the water-closets into the sewers at all (Hear, hear), and in his opinion the practice of doing so ought to be discontinued as soon as possible.

Mr. T. H. CHANCE said it was strange that, although nominally the Farmers' Club was discussing the subject, no farmer had yet said a word about it. Perhaps the farmers thought nothing had been said to give them occasion to speak on the subject, except to express their disappointment at the tone of the proceedings, so far as they had gone. The gentlemen who had read papers had not answered the expectations which were raised when it was announced that the sewage question was to be discussed by the Farmers' Club. So far as he had heard stated, there was no practical suggestion made. He said this advisedly, being aware that both the gentlemen had plans which they believed were perfect. But Mr. Houghton, when he came to his plan, suddenly stopped short, and refused to reveal it except in solemn confidence to a chosen trio of gentlemen (laughter); and Mr. Bannehr's plan, although illustrated by some very interesting experiments, and ingenious and mysterious mechanical appliances, was still a myth until they knew the practical value of his specific. He would suggest that as the meeting was to be adjourned, the discussion should be taken up on the next occasion by gentlemen competent to give it a more practical turn than it had yet taken (applause).

The CHAIRMAN proposed a vote of thanks to the gentlemen who had read the papers. He was convinced that the sewage question could only be disposed of by having the valuable constituents conveyed separately to the farmers. The manure taken from Birmingham many years ago restored much worn-out land, and it was therefore idle to say that the sewage of the town did not contain fertilizing constituents. But he was quite sure that so long as towns persisted in diluting the refuse as they did now, the whole question would remain unsettled. The only thing the existing plan did effectually and well was to disseminate disease and death. As soon as it was adopted in this town, disease broke out where unknown before. He believed that the appliances for completely remedying the present evils existed in this town already (Hear, hear). They had heard from Mr. Bannehr what could be done by deodorization, and he (the Chairman) had that morning been looking at a contrivance at Mr. Cheshire's which was well worth examination, and which he would not be without longer than was absolutely necessary for procuring it from the patentees. He hoped the discussion would lead to much good, and he repeated that he believed there already existed in Birmingham appliances for effecting a complete revolution of the present system.

Mr. CHANCE seconded the Chairman's motion, and said he hoped that at the next meeting the subject would be as ably dealt with from the commercial and agricultural points of view as it had just been dealt with in a sanitary sense.

Mr. KING said that the plans proposed did not provide for the disposal of the "pickles" from manufactories, and the other deleterious liquids poured into the sewers.

Mr. S. BATE said he hoped the reading of the paper would lead to something practicable. He was convinced that the manure must be intercepted and not be allowed to pass into the sewers.

The vote of thanks to Messrs. Houghton and Bannehr having been passed, the meeting adjourned for a fortnight.

## METEOROLOGY.—ITS INFLUENCE ON AGRICULTURE.

This is an age remarkable for discoveries; science has made rapid strides during the last half-century, feeding the mind with knowledge, and adding many improvements with corresponding advantage to our social and commercial position. The oil lamp and candle have given way to gas, which, perhaps in its turn is destined to be eclipsed.

The electric telegraph communicates in a few minutes what the old mail took days or a week (and should the Atlantic cable now in progress become *un fait accompli*, months) to convey. The application of steam as a motive power has far surpassed the most sanguine anticipations of those who watched its development, little thinking its marvellous power would be so easily controllable.

Learned men are not always accurate in their estimate of the value of a discovery: used to rely on mathematical calculations as exponents of philosophy, they are sometimes misled as to practical application. Dr. Lardner (to whom we are indebted for many valuable works) declared the impossibility of navigating a vessel by steam-power across the Atlantic. The biographer of Franklin states that when his essay on Electricity was read before the Royal Society, it was considered ridiculous and absurd. The originator of the shuttle, a simple though now indispensable appendage to our machinery for the manufacture of fabrics, and the value of which cannot be over-estimated in the rank it enabled England, and especially Lancashire, to take in the markets of the world, was so persecuted that he was compelled to leave the country.

Occasionally a man of genius has been able to mature his discoveries, and lay the foundation of, or rear a fortune; these are but few, whilst the fate of the many is melancholy and sad. When their anticipations are not realised, they receive but little commiseration; when they succeed, envy, jealousy, and persecution are too often mixed with their reward, and their means exhausted before their discoveries become remunerative—they plant a vineyard, and have to surrender its possession before they can gather its fruits. One whose inventions are prized in the present day, said when near the close of his laborious life: "All I can do for my family is to leave them the world to roam in, with advice never to seek to make a discovery or invention, but should they do so, keep it from the world; expect nothing, and they would escape disappointment."

Still, the world moves on in cycles of peace and war: nations rise and fall: the arts and sciences expand and collapse; the most truthful, it may be, alone to outlive the storm; whilst Newton, Bacon, Franklin, Handel, Mozart, Haydn, Shakspear, Milton, and others by their creations shed a lustre that illumined their own time, and will continue to immortalize their memories to future generations.

We are led to these reflections on the return of the season that we have been accustomed for some years past to review in these columns, the laws regulating the earth's yielding forth her increase, our accuracy in estimating which has been from time to time corroborated by the statistics of duty levied on hops from the Government returns.

Amongst the natural phenomena most useful to man, meteorology takes a prominent place; its origin, coeval with the "bow in the clouds," an assurance that "the waters should not again deluge the earth;" its antiquity almost as "old as the hills," has ever attracted attention, though reserved to a modern age to be reduced to a science. Shall we wonder at this, when we remember how largely it enters into the economy of life and affects our physical happiness? With what deep anxiety does the husbandman (especially at seed time and harvest) notice every indication of a change of weather, such as the character of the clouds, their colour at rising, and setting of the sun; the halo of the moon; the vegetable and animal kingdoms! Nature animate and inanimate furnishes us with data upon which we may base opinions as to the weather some hours, frequently days, in advance. Aratus, a Greek poet upwards of 2,000 years since, wrote his weather predictions, taking various birds, frogs, &c., as his monitors and guides; but perhaps the most reliable of this class are to be found in

Sir Humphrey Davy's "Salmonia," being founded on known physical conditions. As science has progressed, calculations have been made and instruments introduced. The barometer, especially when rightly understood, is of much value to the mariner and agriculturist, indicating as it does the approach of "storms," "tempests," or change of weather.

Predictions of weather for any length of time are liable to be frustrated by bodies of remote or uncertain appearance (such as the advent of a comet, &c.), and therefore beyond the calculation of the observer; nevertheless much has been done in the gathering and arranging the series of atmospheric observations of past years to guide the anticipations of the future.

The extreme north and west of this country exhibits statistics differing from those of Greenwich, which from its national character can alone be relied on as a standard. The variations, however, of the one are repeated in the others; and could we obtain continuous data, corresponding and confirmatory tables might be produced.

The following table will show the comparative humidity of different stations or districts:—

Glasgow, mean yearly rainfall	41.6 inches.
Newport, I. of W.	33.2 "
Exeter	32.8 "
Oxford	27.0 "
Liverpool	25.2 "
Greenwich	24.0 "
York	23.4 "

The temperature also is subject to a similar range, as shown by the following examples. Those places with a high yearly mean which are least subject to extremes in the various seasons will doubtless command an interest in a sanitary as well as an agricultural point of view:

	Spring.	Summer.	Autumn.	Winter.	Mean.
	deg.	deg.	deg.	deg.	deg.
Plymouth	49.7	60.9	52.9	44.7	52.1
Newport, I. of W.	46.9	59.6	50.8	40.0	49.3
Greenwich	48.4	60.3	49.4	37.8	48.9
Oxford	46.0	59.8	49.5	38.6	48.6
Leith	45.8	58.3	48.9	40.5	48.4
Liverpool	40.2	57.6	49.1	40.5	48.3
York	47.6	60.8	48.3	36.0	48.2
Glasgow	45.1	56.2	46.5	40.6	47.1
Edinburgh	45.0	57.1	47.9	38.4	47.1

A review of the statistics of meteorology for the past fifty years presents many questions of interest for our inquiry. One is: Are there any, and if so, what alterations in the mean yearly temperature or rainfall during that period? Of the latter an extraordinary deficiency has taken place during the last two years.

The mean yearly rainfall up to 1860, deduced from the Royal Society's tables, Howard's Climate of London, and Greenwich observations, is 24 inches vertical depth. Divided into decennial periods it shows:

For 1815 to 1824, ten years, a mean of	26.3 inches.
1825 to 1834,	ditto 24.2 "
1835 to 1844,	ditto 24.6 "
1845 to 1854,	ditto 24.2 "
1855 to 1864,	ditto 22.3 "

In this last period we are deficient nearly 2 inches on the mean or 17 inches on the cycle; but, seeing that in the first a similar difference in excess occurred, we might pass it without remark, did not the fact of its being occasioned entirely by the extreme exceptions in succession of the two past years arrest our attention. In 1863 the rainfall was but 18.9 inches, while in 1864 it reached only 15.7 inches, being but about 2-3rds the mean for each year. We have no year on record so deficient as 1864, and no two such consecutive years as 1863 and 1864. It must be apparent, therefore, that we need a much-increased quantity of rain for the country to maintain its agricultural, and especially its sanitary character; in fact,

authentic reports show that those counties that have contributed less than others to this exceptional state of things present a marked and favourable difference in the per-centage of sickness and death.

As a rule, the extreme fluctuations of one year are compensated by the opposite extreme closely following. Should that occur during the present summer, its effects would be mischievous to the crops. The deficiency of the rainfall of the past two years we would not infer would have a damaging influence; should we get for the next few months a continuance of the opportune return this year to the normal averages: though a large deficiency would still exist, the surface of the land would probably have been replenished sufficiently for present exigencies; but our wells, streams, ponds, brooks, and rivers do not recover the loss, and hence the sanitary condition of the country suffers.

The opinion is often stated that there is a change in the seasons from what they were some thirty or forty years since, "the summers not being so hot or the winters so cold as formerly." Though extreme points of heat and cold may not be so frequent occurrence, the statistics of the following table show a decline in mean yearly temperature in each division of the last thirty years as compared with the previous twenty, traceable to a colder mean in the autumn and winter months:

Jan. to April.	deg.	May to Aug.	deg.	Sept. to Dec.	deg.	Mean.
1815 to 1824	42.11	58.4	48.8	50.1		
1825 to 1834	42.0	60.1	48.9	50.3		
1835 to 1844	41.2	58.9	47.5	49.2		
1845 to 1854	41.5	58.8	47.8	49.4		
1855 to 1864	41.7	58.7	47.6	49.3		

Having thus considered the meteorological phases of the seasons, what lessons do we derive from them? It is interesting and instructive to see and follow its various details; this is but a part of our object. We were the first to invest its study with a practical purpose—in the prediction of the probable productions of our soil two months in advance with some degree of accuracy. Our conclusions are but little influenced by the coming uncertainties of the weather: these may assist us, inasmuch as March usually becomes an index to the meteorological character of the coming summer; and as succeeded by May either above or below the mean, gives reasons for anticipating a good or bad season for cereals, hops, &c.

We limit our deductions to the development of ascertained causes, viz., rainfall and temperature, prior to the middle or end of July, on the maturing crops. The monthly mean temperature from January has a range of 34 degrees, 13 of which occur in the few weeks ending with the close of July (the period at which the temperature of England's mean reaches its climax). And, bearing in mind that from an ordinary May temperature, the more free the progressive readings of the thermometer are from extreme retrograde movements to the maximum of the year, that being also an average, or above it, the more certain are our realizations as to aggregate yield, leaving to a later period the determination of quality. It is on this our chief reliance is placed. Research shows us that nature, in this as in all else, works through causes, like repeating like; and temperatures of progressive and similar character with uniform rainfall, by published and reliable returns, yielding corresponding growths, point to the existence of a truth and law, rather than a record of opinions. To a common remark on these labours, that such information is now of little service, as we have the granaries and markets of the world to supply our deficiencies, we would observe that, knowledge being power, so to be forewarned is to be fore-armed, and important to us as a nation, whilst we have peace; but should the time come (and we know not that it may not be soon) that it should be otherwise, then, and not till then, will the value of such information be rightly estimated.

Statistics are valuable only when their accuracy can be depended upon, and in the grouping of which honesty of purpose and development of principle be the aim—not the carrying-out a favourite idea, based, it may be, on error; whereas in the former, whether worked in cycles of greater or lesser range, the results prove the same—they speak with silent eloquence. That such only has been our aim we would confirm by an extract from a letter of a gentleman who for many years occupied the position of assistant-observer in the Magnetical and Meteorological department of the Royal Observatory at Greenwich, noticing our treatise on this subject, published in 1860: "I have examined your work on the relation of meteorological phenomena to the growth of cereals and hops. That such knowledge is very valuable it is unnecessary for me to remark; but I may be permitted, as a meteorologist, to congratulate you on the care and accuracy with which the data has been collected and arranged."

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## A LESSON TO LANDLORDS—THE REAL CONDITIONS OF IMPROVEMENT.

It is so often our duty to refer to the speeches of public men and great landowners, made at agricultural meetings, as being either vague or deceptive—as either losing sight of actual questions in mere generalities, or purposely misleading the audience—that it is most satisfactory to have to refer to a speech dealing plainly and directly with the true wants and actual circumstances of English agriculture. Such was the address made by Lord Stanley at the Ormskirk Agricultural Society in Lancashire. Lord Stanley has before made more than one useful speech on agricultural topics; and the sensible and business-like opinions he has always enunciated should be laid to heart by the class to which he belongs. And it is not a little remarkable, as indicating great want of knowledge of the economical conditions of English husbandry, that of two daily newspapers which have commented on Lord Stanley's speech, both have missed or ignored its really important part. Now, Lord Stanley, by looking at husbandry as it exists within his own district, and speaking plainly the results of his own observation, has read a lesson to landlords which it would be profitable alike to themselves and their tenants they should study and act upon.

Lord Stanley referred to the "position and prospects" of the Society whose anniversary he was keeping, and showed his appreciation of the uses of such local societies, when he said, "We are not a very ancient Society—all the better for us, I say, because we are clear of antiquated rules and unsuitable customs." That is quite true. He also remarked that the number of enrolled members was not to be taken as an absolute test of the good done by an agricultural society, as those who

visit the show may equally profit by the lessons there taught. Then, having said something in favour of small local societies, Lord Stanley adverted to the "deeply interesting question of what are the prospects of agriculturists in these districts; what has been and what is doing here?" And, while recognising "the immense improvement of the last twenty-five years," he said "that Lancashire farming is still not, upon an average, what it ought to be and what it will be." He attributed this to the vast increase of trade and manufactures in the district, which draws off capital and energy in other directions, and partly to the fact that the landlords obtain so much of their incomes from coal and building land, that agricultural operations become to them matters of secondary importance.

In Lancashire the non-improvement by landowners is due to their wealth, not to their poverty, and their comparative indifference to the improvement of their merely agricultural property. The unfavourable opinion which exists as to the soil and climate of the district also prevents farmers of capital and enterprise coming there from other districts. Yet, though the land requires deep draining and there are some other disadvantages, "we have," said Lord Stanley, "more capital at our doors than is possessed by any county excepting the metropolitan county of Middlesex; we have a greater quantity of machinery; we can get better machinery, and we can get skilled men to manage it, and we can get cheap coal to work it with. The flat expanses of this county are singularly favourable for the operations of the steam plough; and what is perhaps more important than all, we have in Liverpool and the adjacent district a market absolutely insatiable, especially

for dairy produce." But what is more especially wanting is, "a more thorough conviction, especially among landlords and tenants, that farming, in order to be carried on efficiently, requires both capital and training. I do not look forward, as some people do, to see all small holdings extinguished, and to see the whole country divided into enormous farms of many hundred acres. I shall be sorry to see that day upon social grounds, and I do not believe it will be economically necessary." And he went on to say he believed that farms of from 100 to 200 acres might be worked with all the appliances of modern skill and science by means of combinations amongst neighbours to purchase or hire improved machinery.

Perhaps there is no farming which can be so well carried on upon a small scale as dairy husbandry, and that is the mainstay of the farms of the district in which Lord Stanley was speaking. But it by no means follows that, because farming by men of competent skill and capital is best pursued on a large scale, large farms alone are to exist. The size of farms greatly depends on the nature of the district. On light soils, where large flocks and large breadths of turnips are essential to good husbandry, the farmer of less than 300 acres will seldom do much good, and very much larger farms may in such districts be occupied with advantage. On stronger soils, and where cattle, as the rule, will be found more advantageous than sheep, farms of from 150 to 250 acres, if well managed, may afford decent living to the occupiers; but where a farm does not exceed 100 acres, the occupier can only succeed by becoming literally a working farmer, probably milking his cows and shepherding his sheep mainly with his own hands. Yet to each and to all of these various classes of farmers, the principle laid down by Lord Stanley equally applies; they must all have the necessary degree, though perhaps different kinds of training, and they must all have sufficient amounts of capital to manage their various farms with success. We agree that it is not desirable to have none but large farms, for there are many farmers who could manage 200 or 300 acres very well, but who, from want of sufficient capital or otherwise, would be ruined on farms of 500 or 600 acres. Again, whether the farm be large or small, the tenant must be secured in his possession, and be freed from needless restrictions. And on this point Lord Stanley spoke most judiciously—and it is the point of his speech the commentators have omitted to notice—saying, "I think that every good tenant who is expected to stay permanently on the farm he holds is entitled to ask for a lease or the offer of a lease; . . . if a tenant is to be expected to lay out capital on his farm, it implies no distrust of the landlord; it is simply an ordinary and a proper business precaution that he should insist on having a lease." And he added that upon Lord Derby's estate, "no good tenant has been or will be refused a lease, except under some peculiar circumstances, where the arrangements made were only temporary, and where some change in these arrangements is contemplated." Nothing can be more satisfactory. The only further matter would be that the leases to be granted should be free from needless restrictions. On this point Lord Stanley was also explicit. He said, "It is quite right that the landlord, whose interest in the soil is permanent, should secure himself against ill usage or exhaustion of the land by one whose interest may be only temporary. There can be nothing said against that; but that may in general be done by a few simple provisions, and I don't hesitate to say that leases, as they are framed over the greater

part of the country, are in many—perhaps in most—cases coupled with conditions which are unnecessarily complicated and unnecessarily restrictive." But then, it is sometimes said, such conditions are never intended to be enforced. The answer to that is plain. "If you don't want to enforce them, what is the use of having them? I believe that these two things—the one making the giving of leases the general rule, the other having leases drawn more simply than, as a rule, they are at present—I believe that those two matters would go very far to settle that question of land ownership of which we have heard something of late." Now, as these principles involve, as they necessarily do, the non-reservation of game to the landlord, there can be no difficulty in saying that Lord Stanley has comprised in his speech the whole duty of landlords, and that if those principles should come to govern the management of English land property, a new and happy era for farmers and landowners would commence.

With regard to the state of landed property, some alarm had been expressed of late "lest the soil of England should be swallowed up by a certain number of great proprietors. We have been told that large estates are everywhere increasing, that small proprietors are everywhere dying out, and that therefore the bulk of the population is being separated from the soil." And he said that in his own district, "although there has been a great amount of transfer, it will be found that those transfers have been, in by far the majority of cases, not in favour of old possessors of the neighbouring property, but rather in favour of a new class of proprietors who have made their money in towns." The real change taking place is, "that the old small freeholder, burdened with debt up to the ears, is being bought off, and his place is being taken by those who have acquired wealth in commerce and manufactures." The small owner of land who farmed it himself found that he could do better by selling his land and becoming the tenant of that or some other farm, than by retaining a merely nominal ownership. "And thus," said Lord Stanley, "it was in this country that the number of small freeholds was gradually diminishing—but diminishing not, so far as his observation went, in favour of a few colossal properties, but rather of moderate-sized estates purchased by capitalists who had acquired wealth elsewhere. He believed that if this state of things in England were investigated, county by county and parish by parish, that would be found to be a true description. That was not a state of things that they need regret. Let them try to give the farmers a more independent possession." And he advocated the means of giving labouring men at a moderate rent freehold cottages, and thought, whether they agreed with him or not, that they would be of his opinion "that it would be better for him to discuss such matters as those to which he had alluded than paying them mere compliments." Upon the distribution of landed property in England, and the changes it is undergoing as referred to by Lord Stanley, we shall on another occasion say something. This however we may at once say, that though it is quite true the existing landowners as a rule do not much increase their possessions, the new landowners who invest their large savings from trade and manufactures in land scarcely carry into their new position those sound rules of commercial management which enabled them to buy the land. They are too apt to assimilate to themselves much of the erroneous methods of management of their predecessors.—*Economist*.

## EMANCIPATION AND THE COTTON CROP OF THE SOUTHERN STATES.

SIR,—Whatever may be the upshot of the American civil strife as to the union or permanent separation of the formerly United States, one thing is clear enough—that Slavery is a doomed institution.

The general impression that prevailed in this country in 1860 respecting slavery was gathered from the statements of the abolitionists. All earnest reformers say more than they mean, and ask for more than they want; and the abolitionists, fearing that the indignation of the world would not be sufficiently aroused by the bare statement of truth, felt that in order to excite a strong impression of opinion against the abuses of slavery, it was necessary to colour and exaggerate the truth

concerning them. The sufferings of the slaves were depicted in the most vivid colours, and we were given to understand that the entire black population was awaiting an opportunity to rise as one man, and satiate in the blood of their oppressors the vengeance that had been accumulating during two centuries of wrong. The events of the last four years prove that this party in the United States pictured the state of things rather as they wished to see it than as it really was. The appearance of the Northern armies in the Southern States produced but little effect, and the emancipation proclamation of the late President Lincoln scarcely seems to have quickened a pulse in the circulation of this black mass of stolid humanity. We must

take for granted one of two things: either that long subjection to a life of severe bondage has ground the manhood from their souls, or that they have not really been quite so badly treated as we have been led to suppose. Facts are certainly in favour of the latter supposition.

Although we may have been misled in this respect, I think we need not fear of falling into error with respect to the future. Whatever may be the decision arrived at by the central government as to slavery when arranging a compromise with the Southern States, little foresight is required to enable us to foretell the speedy termination of a state of society so perfectly anomalous. All who have had to do with the planting of slavery in America have now paid the penalty of the unnatural crime. The power raised by the Southern States to enlarge the area of slavery has been shattered; the treasure accumulated by the Northern States in their traffic in slave-produce has been squandered; and while America has felt the rod of chastisement, England, as a participator in the sin, has not escaped it. The disorganization that has been introduced into the slave states during the sanguinary contest which now seems to have come to an end is such as to make it impossible ever again to bring the slave under subjection to the lash. If the black did not see any great good in flying for refuge to the bosom of the Federal President, he has seen enough in the past four years to show him that he need not resume work on the former terms unless it pleases him to do so.

Supposing then that slavery is doomed, I think we must consider the cotton crop of the Southern States to be doomed also, and this is the agricultural side of this question to which I wish to direct a little attention.

The cotton-growing states of America are confined within the following limits: from 29 deg. to 37 deg. north latitude, and from 76 deg. to 95 deg. west longitude. Within these extensive lines what may be strictly termed the cotton-growing states comprise 727,530 square miles of country.

Of these states Virginia is the most northern. Its cotton region extends only along the border of North Carolina; a small area, which in 1859 produced but 12,727 bales, the produce varying between 70 and 120 lbs. of clean cotton per acre, the sharp frosts being unfavourable to its growth.

The cotton-growing of North Carolina is confined to that half of the State which lies to seaward of the 80th deg. of longitude. In 1859 the produce was 145,514 bales (of 400 lbs.). The average produce is 200 lbs. per acre. Much land in this state that is suitable for cotton is more profitably occupied by pine and oak forests; and here, though the soil is light and loamy, the frosts are found to blight the promise of the year.

South Carolina, the smallest of the Southern States, produced, in 1859, 353,413 bales of cotton. The land and the climate throughout the state is very favourable to the crop in question, and it seems that 200 lbs. may be put down as a fair average of clean cotton per acre. The loamy and brownish-red clay subsoil forms a productive bed for the upland cottons, which are cultivated to the very mountain bases in the north-western part of the state.

Georgia, celebrated for a fine population derived more exclusively from an old English cavalier stock, produced, in 1859, 701,540 bales, the average of the yield being 230 lbs. per acre. Cotton in this state is cultivated from the sea coast in every direction—over the plains, rolling lands, high hills, low valleys, and up to the very mountains, which often run precipitately down into the plains. The soil is peculiarly adapted to the crop, the surface soil being more loamy, and the subsoil rather stronger than that of the states already mentioned.

The state of Florida yielded, in 1859, 63,323 bales. It abounds with splendid land—a sandy loam, upon a red clay subsoil upon limestone, which is found to be marvellously fertile; but the facilities of conveyance are as yet much neglected, and the population very sparse.

The cotton district of Alabama may be said to comprise the whole state. The product in 1859 was 997,978 bales, of 400 lbs. each. "Her soil," says a writer who knows her well, "is her gold mine." It resembles what I have stated that of Florida to be. The average yield of these fields, separated by hedges of rose trees, varies from 130 to 600 lbs. of clean cotton per acre.

Mississippi state is very favourable for the growth of cotton. Both the high lands and the "bottom lands," or alluvials along the river sides, produce large crops of cotton. The total yield is 1,195,699 bales, of 400 lbs. weight,

Louisiana, in 1859, produced 739,318 bales, of 400 lbs. each. The land is rich, and resembles that of the two last-mentioned states.

Texas: This fertile State, whose whole area (which is more than three times larger than Austria) is adapted to cotton culture, yielded, in 1859, about 405,100 bales, all of the upland sort, for which it is famous. The average yield per acre is estimated at 300 lbs.

Arkansas in 1859 produced 367,485 bales of upland cotton. It possesses, in soil and climate, the same advantage as Mississippi and Alabama; but this categorical comparison will be more clearly understood by a glance at the following table:

Name of State.	Square Miles.	White and Col. Pop'n.	Bales of Cotton of 400lbs each.	Whites.	Slaves.	Free Col'd.
Virginia ...	61352	1566318	12727	—	—	—
N. Carolina	45000	992622	145514	631100	331059	30263
S. Carolina	24500	703708	353413	291388	402406	9614
Georgia .....	59000	1067296	701840	591588	462198	3500
Florida .....	59289	140025	63322	77746	61745	932
Alabama .....	50722	964201	997978	526431	435090	2680
Mississippi..	47156	791305	1195699	353901	436631	773
Louisiana .....	46413	708002	723218	367629	331726	18647
Texas .....	237321	604215	405100	421294	182666	355
Arkansas .....	52198	435450	367485	324191	111116	144
Tennessee .....	45800	1109801	227450	826782	275719	7300
Kentucky .....	37680	1155684	4082	—	—	—
Missouri .....	67380	1182012	100	—	—	—
Illinois .....	55405	1711951	6	—	—	—
Utah .....	—	40273	1133	—	—	—
Totals.....	867996	13192853	5198077	4402052	3030346	74718

The following table, taken from Col. De Coin's little volume, which treats of the cultivation of "Cotton and Tobacco," will throw a little further light on this subject. It displays the proportions which the population bears to, the cotton-produce in the various States:

Illinois produced one bale for every 285,325 of population	
Missouri .....	11,800 "
Kentucky .....	282 "
Virginia .....	125 "
Utah Territory .....	35 "
N. Carolina .....	7 1/2 "
Tennessee .....	5 "
Florida .....	2 1-5th "
S. Carolina .....	9 "
Georgia .....	1 1/2 "
Texas .....	1 1/2 "
Arkansas .....	1 18-100ths "
Louisiana .....	0 98-100ths "
Alabama .....	0 90-100ths "
Mississippi .....	0 67-100ths "

An attentive inspection of these two tables will render it very easy to believe the statement made on the faith of statistical returns, namely, that out of 5,198,077 bales of cotton produced in 1859, not less than 5,000,000 were produced by slave-labour, and whites owning a few slaves; leaving only 198,077 bales as the result of cultivation by slaveless whites.

We have seen and felt the effect of emancipation in Jamaica. The large coffee and sugar plantations in that colony fell out of cultivation. The wants of the black are of the simplest kind. From that fertile soil both his scanty raiment and his coarse food are produced with little more than the expression of a wish, and the black is not the person to work for future provision. What has happened elsewhere will probably happen in the Southern States. Very little work is likely to be done when slaves have merely to work for their own maintenance. The consequence will be that the low lands or alluviums, which can alone be cultivated with slave labour, will return to their primitive state, and cotton culture by the whites will only extend to a few patches in the uplands, and will be confined to those who have been engaged in such work.

The prodigious crop of 1860 was obtained only when the whole machinery of the Southern States was in full play and fine working order. Organised forces were to be seen right and left—here a hundred hands and there a hundred hands, working in concert, to produce some 600 bales of cotton, under the direction of one manager, who also provided at heavy expense the requisite machinery for ginning and packing the

fluffy crop. Suppose the bond to be broken which binds these workpeople to their master, it must be admitted that, if ever the same productive issues are reached, under a newly-constructed system, it must be after a period of virtual stagnation which will accompany and mark the transition of a large popu-

lation from bondage to freedom. If the plantation and the railways of the South are made to depend upon the labour of the black man, they will both return to chaos before he as a free labourer will again call them into active operation. Yours,  
HOWARD REED.

## FARMING IN WEST SUSSEX.

In pursuing our perambulations in St. Leonard's Forest, we visited and rode round with Mr. Kay, agent to Mr. Scarth's landlord, Mr. Hubbard, who has a considerable estate in this neighbourhood. Anything more picturesque and otherwise beautiful than is the thickly-wooded undulating surface of some parts of this domain we have never seen, and this was rendered additionally charming from its being what may be fitly termed the first blush of the spring with which this year fairly burst into life, the weather being so still and warm that it was like August temperature; but instead of the rustling corn and cheer of the harvest men falling on the ear, the only noises that at eventide broke the silence were the crowing of an occasional pheasant, the song of thrushes, and the mirth of nightingales. Nature, for the time being, was in her merriest humour, and wearing her happiest face.

But our mission was more agricultural, and here the same approval and praise could not be bestowed. Not that we have now any special point of practice to further criticise or ridicule, but under the greatest efforts or the most skilled management the labour of men will sometimes fail. One particular instance of this we omitted to mention last week: we refer to the crop of winter peas. Before the warm weather of April began, these plants were said never to have looked more promising; but all over the country we saw fields of this crop had been, or were being, literally cleared off by myriads of minute insects—an attack that was quite new to us, and to everyone we heard speak of it. These insects are long, round, and brown of colour, and more in appearance, if not in form, like hen-fleas than feeders on vegetation. Their mode of proceeding was generally to eat the leaves of a plant clean up, and then attack the next one, which till then had been growing vigorously. Mr. Scarth had a field, the plants of which were six or eight inches high, nearly cleared off in about a fortnight, the result of which would have to be a crop of swedes or turnips. Some neighbouring fields were similarly destroyed, and we have since been informed that in Surrey and other counties a like pest has done similar destruction. Sparrow fanciers will probably say, "Ah! another instance of the insane practice of killing down that useful bird." But if all the sparrows in the county had been collected in this parish, it is doubtful whether one of them, precocious and knowing as these birds are, would have found out the minute insects in question; and if they had, and they had got all into one field, their vigilance would have been taxed, and their appetite for bug-food keen, if they had in due time made an effectual clearance.

Mr. W. E. Hubbard has now two farms in his own hands, besides some outlying fields that have been recently grubbed. The first farm we arrived at is named Plummer's Plain, and consists of 445 acres arable, 7 acres grass, and 8 of wood and waste. Steam cultivation has been regularly practised on this estate since 1859, for this system Mr. Kay considered absolutely indispensable for him to get through the amount of work that he then had before him, in the form of cold, "hide-bound," and foul fields, newly-grubbed enclosures, and woods that were about to be made into arable land. The set of tackle used was on Mr. Smith's "Woolston system," made by Messrs. Howard; but Mr. Kay has fallen in with Mr. Scarth's views on preparing land for the wet and frosts of winter, and he accordingly hired the Messrs. Howards' plough from Mr. Scarth to do some of the work of last year. In 1864, the work done on this farm amounted to 260 acres ploughed and 400 cultivated, the ploughing having been done from eight to ten inches deep, and at the rate—the plough being a three-furrow implement—of about five acres a day; the cultivating having gone off at the rate of from five to ten acres a day, according to circumstances. On this farm seven horses have done the work; but in addition to the ordinary work of the farm, in the last eighteen months—the time

this farm has been in the owner's hands—the materials for draining 200 acres have had to be drawn, the work of which would be considerable, although a tile kiln is on the estate.

The land of this farm is of a very different character to that which we described last week. White and yellow sand here largely abounds, which is intermixed with veins of gravel and impervious rock-like strata of clay and other compact substances. It was this unevenness of soils which made a complete system of re-draining necessary. This farm, when taken in hand by Mr. Kay, was in a very run-out condition, the reasons for which need only to be mentioned to be obvious. As this was originally forest, and some of it was so not long since, it once contained, in a state of admixture with the surface, a considerable amount of black mould or humus, such as the debris of generations of brushwood and trees and other wild plants would form. This debris offered a seductive temptation to farmers of the past to draw upon the stock they had in reserve by applying means which were inexpensive. The first of these was the use of lime, which was found to produce at starting wonderfully improved crops, and this result continued more or less remunerative so long as any of this debris remained. But in course of time this exhaustive practice became unprofitable: for lime does little more than exhaust, by exciting the carbon or humus previously deposited, when there are sufficient available mineral matters in the soil; and the farmers who pursued it became, as a natural consequence, so far as income from farming went, exhausted too. Thus, instead of paying proper attention to green or carbon-collecting crops, a list of which need not be here repeated, and depositing these in the soil, either directly or in the droppings of sheep, simple ploughing and liming were trusted to, and the result was what we have explained. The only sheep that were kept were a few Romney Marsh "critturs," that were sent over here to "winter" at a trifle per head.

This was the condition of this farm eighteen months ago, when Mr. Kay undertook, on the part of its owner, to put it again into tenable condition. The main step—for steam cultivation is a mere auxiliary in the better development of well-established practice—which Mr. Kay took was to produce an abundance of food for sheep, and otherwise carry out this system of restoring soils by folding, and which we have so recently discussed and commended that we need not here dwell on it at length. Large quantities of guano and artificial mixtures have been used, and cake and corn are being fed on the green crops thus extraneously fertilized. There are now, or were at the beginning of the spring, forty acres of excellent rye, and tares, and trifolium, the feeding of which, under the plan referred to, was going on. This land will be for turnips, for winter and spring feeding; and like the clay land, when similarly treated, it will be greatly enriched for the next crop by the deposit of carbon that will thus accrue. By depositing—and which is here necessary after the tares—a small portion of superphosphate or some special compost in the drill, to nurse the young plants through the first month, when they will be able to digest the dissolving roots of the present green crop, the yield will be far heavier, making no allowance for the cake and corn eaten with the present crop, than had the land lain fallow through the winter and spring, and been knocked about by machinery. In the one case nothing would have been added, while something, and perhaps much, would have been lost by drying up and washing away; but in the other case much plant-food would be accumulated; and by the chemical action induced during decay, if this be properly done by turning the roots and stumps under in a green state, and allowing them to remain till rotten, more mineral elements would be made soluble than would arise from all the mechanical action that could be bestowed. In this reasoning we have not overlooked



the effect of the dung and urine which, during the feeding-off the green food, would have fallen direct on the soil, for dissolving it in the same way as straw is dissolved or decomposed when similarly charged. This is one of the important points which seem to be almost altogether lost sight of by the extreme advocates of rich farm-yard manure, made and rotted in the position in which it was trodden down in boxes and covered yards. If acidulous urine be produced by eating green vegetation, or if this be improved into a more ammoniacal liquid by giving the animals linseed cake or corn with the green food—as both qualities of liquid will, during fermentation, act more or less powerfully and efficiently in dissolving the mineral compounds of soils—and as straw has once been in a dissolved or liquid form, and is therefore easily made again soluble, it is sheer waste of time and power to make a point of highly charging straw with animals' droppings when a slight charging would suffice, and the remainder might be so profitably used as a direct dressing, for the dissolving purpose in question, to semi-exhausted or run-out soils. One-fourth the straw of a farm may perhaps be profitably trodden down under cover, and highly charged with dung and urine for some special application, such as for mangold, lucern, clover, or grass; but to go beyond one-fourth would, in nine cases out of ten, bring commercial loss, notwithstanding that the buildings for carrying out the process may have looked very pretty on paper, and the theory in support of the system have been very plausible to hear, and the novelty of the practice very pleasant to behold.

The other farm is named Eastlands, and consists of 420 acres, viz. 32½ arable, 76 grass, and 20 wood. Till recently there were only 166 acres to this occupation, 100 being arable and 46 wood. The remainder, above 200 acres, has been grubbed, the result being a fine sheep and stock farm, albeit some of the fields are somewhat more hilly than any one with choice open to him would prefer. The buildings, which are now most complete, have nearly all been built new, or modernized; one instance of which is, a barn has been made into a mill-house, and meal and chaff-bins at one part, and into boxes for calves at the other part. These mills are here highly necessary, as water-power is small in this neighbourhood, and with a steam-engine for ploughing, thrashing, and sawing, windmills have not followed in the wake of extended and better cultivation; the roads, which are also getting good, have mostly been newly made, and 250 acres have been recently drained. This work has been done with seven able-bodied horses and a pensioner. A good house is now about to be erected, and when this has been done, six horses, if the present system of flock farming and inexpensive and not fanciful manure-making be pursued, will do the work easily.

Steam cultivation is here looked upon as a necessary part of the farming operations, and therefore there is not much to catch at as special or presenting novel features; but the whole farm may be described as being in admirable trim. A few points, however, we may mention. One side of this farm is strong clay, and here all the fields are on the flat, without ridge or furrow. One field of 25 acres, about three times as long as it is broad, was last year, for the convenience of the stock, cropped in parts with beans, peas, tares, and trifolium. After these crops were off, it was steam-ploughed early in the autumn, when it was manured on the top, and after a while the cultivator was run through it, most of the manure of course still remaining on the top, and wheat was sown. Nothing can possibly look better than this wheat now does. This is the plan, it will be remembered, which Mr. Henry Evershed was practising last autumn at Gosfield in Essex, and which we made a note of at the time. If the appearance of crops so treated by Mr. Kay be any criterion, Mr. Evershed must also be fully satisfied with this inexpensive and readily-carried-out method. These 25 acres were done in two parts, with one pitching of the engine half-way along the top fence. A piece of land in front of the homestead was similarly treated for oats; and although this is strong clay also, and there is an abrupt hill at the top of the field, there is no fear, now it is drained and deeply cultivated, that the surface will wash, or that water will accumulate. We have before said that, under these conditions of drainage and cultivation, furrows are only troughs for water to accumulate in. Ten or twelve inches of stirred soil will not be again so compressed by preparing for a crop as not to be able to absorb—sponge-like or chalk-like—as many

inches of water as ever fall at once, except it be in such cases as extraordinary storms or water-spouts, against which no human arrangement can provide. This being so, excess of water rapidly draws beneath the surface to the drains. We thus again touch on this point, as we find it is occasionally still held that clay cannot be farmed without furrows. All we need add is, where this belief still exists, it is because ploughing, as Mr. Searth practises it, instead of cultivation, is not followed. Or the fault otherwise exists in the management pursued by the living clay, and not in the inanimate article.

Mr. Hubbard has been induced to become possessed of some of the "thoroughbred" shorthorn stock, about which there has of late—and particularly in the *Mark Lane Express*—been much smart and justifiable criticism. A well-meaning landowner like the gentleman in question, who is desirous in every possible way of improving the animals on his estate and in his own neighbourhood, is just the customer that the unscrupulous puffers referred to would be likely to get double the money from that an animal would be worth. Out of about twenty of these "pedigree" animals there are about five worth stopping to look at, from a public point of view. Eastland Chief, by Duke of Brunswick, dam White Rose, is a good fleshy two-year-old roan, to which was awarded Mr. Lamson's cup at the last Horsham show, the condition being that cows should be allowed to go to him at 10s. each. Carolina, a red and white cow, and Peerless and Whortlebury, red animals, are three fine up-standing cows, with straight wide backs, good hips, and such long tapering heads as properly belong to well-grown shorthorns. There are also two good three-year-old red heifers; while Lady Jane is pretty, but a small and otherwise a degenerated red and white cow, as are some others, the names of which we, under pressure for time, did not stop to note, yet, if we had, they would not have been worth repeating, as these animals had altogether departed from, or missed ever approaching to the appearances which are supposed to belong to the noble Shorthorn, and were in weight and form very indicative of some Ayrshire or Angus blood having been surreptitiously introduced through a dam or otherwise into the strain from which they or their ancestors sprung. There were fourteen capital calves, some being pure "pedigree," and some not so.

Mr. Hubbard has long had a flock of excellent Southdowns. There are now 300 ewes, and these are as good for size and uniformity as any one need look at for all practical purposes. They have been bred from rams of the best flocks. For many years past all the rams have been bought, some from one skilled breeder and some from another. Among the whole of the ewes we did not see a scrubby fleece, nor a patch of dark wool between the scrag and poll. The former indication shows there is ample thrift in this flock as it now stands, and the latter purity of wool shows that, in aiming at size and aptitude to run to proper substance, care in selection has otherwise been very properly exercised. As this flock has been migrated from farm to farm, and to outlying fields, as feed came on under the extended and improved cultivation above referred to, we did not attempt to ascertain by calculation the number of these sheep that had been kept to the acreage. The Southdown, with its fine mutton and hardy *physique*, is, notwithstanding its coat is short, about to have, now that the American war has terminated, and cotton is coming down to its rational price, that return of popularity and fortune which its excellence deserve. Mutton is already on an equality with wool, and in a few months mutton will be in increased comparative favour. In the present condition of this country as regards population, demand for animal food, and short number of animals to supply this demand, no other result could long continue. The St. Leonard's Estate flock had this year ninety-five twins, and both the ewes and lambs are in excellent store condition, to preserve which an enormous cost for labour and corn and cake must, during the last severe season, have been expended. Some of these will be fattened off as above at fourteen and fifteen months, the superfluous lambs being sold in July, and the draft ewes at an autumn fair, when they will probably be bought up for the eastern counties to make fat lambs from, and get fit for the butcher themselves, or they may be there used on clay farms to breed stores by Norfolk rams, that they may have more ranging issue suitable for Norfolk flock-farming.

W. W. G.



## AGRICULTURAL PRODUCTS IN THE DUBLIN INTERNATIONAL EXHIBITION.

International Exhibitions are becoming so general and frequent that they are losing altogether that interest which originally attached to them as competitive displays to mark the progress in arts, agriculture, and industry, at quinquennial or decennial periods. In too many instances they are now set on foot merely as speculations to draw visitors to a locality, or to inaugurate with *éclat*, and thereby advertise, some building set on foot as a joint-stock adventure. As a consequence of this, all that is unattractive and uninteresting to the dilettanti public—such as raw materials used in the arts and manufactures and agricultural produce—is eschewed, and the fine arts now have the ascendancy. Pictures, sculpture, photographs, jewellery, dress materials, and such things as will attract the sight-seeing public are alone sought or cared for. Of this we have an instance in the Dublin Exhibition now open, which, in representations under Section III., "Substances used as Food," is one of the most scant it has yet been our lot to witness, and even the agricultural machinery and implements sent have been turned over, as unsightly and uninteresting, to the yards of the Royal Dublin Society. There are just twenty-five exhibitors of food substances in the British gallery, and these consist of a heterogeneous lot, six showing confectionary and biscuits, three whisky. Out of the number there are but four British exhibitors of agricultural produce or cereals, omitting mustards and starches and oatmeals. Mr. Macrony shows Irish wheat and flour, besides flax and other products; Messrs. Hogg and Robertson of Dublin, a collection of cereals; Mr. J. Makey, also of Dublin, seeds. These, with Mr. Hallett's pedigree wheat, comprise the British agricultural exhibits. The colonies certainly do make a better display in this respect, although they have been much restricted as to space. Of wools there is a very good collection shown by Queensland, New South Wales, and Victoria—the latter sending twenty-five picked fleeces from the Intercolonial Exhibition held in Melbourne in 1864—and there is even a fleece from the Falkland Islands. Some of the principal London wool-brokers also contribute interesting series of well-labelled samples. Natal, too, sends wool, wheat and other grain, besides a fine miscellaneous collection of agricultural products. Nova Scotia sends fruits and grain; and Canada has a very fine display of agricultural produce, contributed by the Boards of Agriculture of Upper and Lower Canada and by private individuals. The samples of wheat, oats, Indian corn, and other grain are very fine. The quantity of grain produced by Canada annually seems almost fabulous. Of wheat, last year, over 25 million bushels were grown, of peas 12 million, of oats 40 million, and of buckwheat 13 million bushels.

The tenacious blue-clay lands which form the principal feature of Lower Canada constitute a strong and rich soil, bearing in abundance crops of all kinds, but particularly well adapted for wheat, and were in former times noted for their great productiveness. These lands have been for a long time under cultivation, and by repeated cropping with wheat, without fallow, rotation, deep-ploughing, or manure, are now, in a great many cases, unproductive, and are looked upon as worn out or exhausted. A scientific system of culture, which should make use of deep or subsoil ploughing, a proper rotation of crops, and a judicious application of manures, would soon, however, restore these lands to their original fertility. The few trials which, within the last few years,

have been made in the vicinity of Montreal and elsewhere have sufficed to show that an enlightened system of tillage, with subsoil draining, is eminently successful in restoring these lands, which offers at their present prices good inducements to skilled farmers. Besides grain and green crops, these soils are well-fitted for the culture of tobacco, which is grown to some extent in the vicinity of Montreal. Notwithstanding the length of the winter season in Canada, the great heat and light of the summer and the clearness of the atmosphere enable vegetation to make very rapid progress.

In no part of the province, however, have skilled labour and capital been so extensively applied to agriculture as in Western Canada, and the result is seen in a general high degree of cultivation, and in the great quantities of wheat and other grain which the region annually furnishes for exportation, as well as in the excellent grazing farms and the quantity and quality of the dairy produce which the region affords. This western portion of the province, from its more southern latitude, and from the proximity of the great lakes, enjoys a much milder climate than the other parts of Canada. The winters are comparatively short, and in the more southern sections the peach is successfully cultivated, and the chestnut grows spontaneously.

But it is from the Australian colonies that there is the finest display of grain. South Australia, New South Wales, and Tasmania furnish small samples; but Victoria comes forth on this occasion in strong force, with oases of beautifully clean and heavy wheat, oats, barley, &c. There is one sample of wheat shown by the Ovens and Murray River Agricultural Society, labelled 68½lbs., and several others 68lbs.; whilst oats weigh 50½lb. to the bushel.

To show that Victoria is making headway in grain produce, we may here direct attention to the result of the first colonial grain show just held at Ballarat under the management of the Ballarat Agricultural Society and the auspices of the Board of Agriculture of the colony. The President, in addressing the Governor, Sir Charles Darling, who visited officially the show, remarked in his address "that His Excellency would have an opportunity of observing within their show-yards that Ballarat was not only justly famed as being the metropolitan gold field of the colony, but was also the centre and market of a very important agricultural district." The exhibits of grain were really superior—fully equal to any which had yet been seen in the colony. There were twenty-five entries for the four prizes given for wheat, of £40, £30, £20, and £10 respectively. The first prize was awarded to Mr. Jeremiah Coffey, of Creswick, for a very beautiful sample, which weighed 68lbs. to the bushel. The weights of the other three parcels were 67½lbs., 68lbs., and 67½lbs. respectively. The first and second prizes were of the variety known as White Tuscan, and were both grown from Victorian seed. Mr. A. Martelli sent in some Russian wheat, from his farm at Lillydale, produced from seed imported the previous year. There were sixteen entries for Tartarian oats, the two prize samples weighing 46lbs. and 45½lbs. respectively; the first prize being awarded to the latter, the former receiving the second. A silver challenge cup of £50, offered by Mr. R. Dunn, for the best hundred bushels of English barley, was taken by Mr. John Leishman, of Forest Hill, Kingston. The prize grain was submitted to public auction, and realized from 15s. to 22s.; the oats fetched from 6s. 6d. to 7s.

The fact that there are now about 115 flour mills in the colony shows that they are beginning to produce largely for themselves. Still the colonists are far from being independent yet of extraneous supplies. It would be of great advantage to the Australian colonies if some prompt mode were devised and put in force for ascertaining the extent of their crops actually garnered, instead of merely the number of acres under crop. The average is so uncertain and so variable in different districts, and in different localities in the same district, that no reliable information can be gleaned from the latter mode, but the first would furnish facts of the utmost value to the grower and trader in grain or other produce. For the want of this knowledge last year, Tasmania shipped away all her grain and flour at low rates, and had to import both at a late season of the year at exorbitant prices. It is not probable that this mistake will be repeated this year, as prices now rule so high throughout the colonies, as must induce large importations from Chili and other corn-growing countries.

Tasmania grew 54,000 acres of wheat in 1864, from which a yield was obtained of 950,000 bushels: Victoria grew 149,000 acres of wheat, from which they got a yield of 1,338,000 bushels. That would give Victoria rather less than 9 bushels to the acre, and Tasmania between 17 and 18. No such crops of wheat can be looked for on the Australian mainland as in Tasmania; nor does South Australia, which is one of the largest growers, pretend to them. To come up to Tasmania in wheat-growing relatively to her population, Victoria should

have had 824,000 acres under crop in 1864, instead of 149,000.

Turning now to foreign countries, there is one sample of flour in the Exhibition shown from Austria. From Belgium there is rather more agricultural produce sent, the exhibits including hops, leaf-tobacco, wheat, rye, and other cereals, kidney beans, roots for cattle, and agricultural seeds. From France there is one exhibitor of wheat and flour, and one of chicory root. Bavaria sends a bale of new hops. Italy makes the best display; but, unfortunately, the multitude of hams and sausages, cheese, biscuits, and macaronis, and dozens of oil-flasks and wine-bottles, give the collection too much the aspect of an Italian warehouse. The Agricultural Association of Lucca shows a good collection of agricultural produce. There is hard wheat from Macerata; rice, hempseed, pulse, and foreign seeds by various exhibitors; and a good collection, embracing 52 varieties of Indian corn, by B. Racagni, from Brescia. A good collection of hemp is shown, and Italy has come out quite strong in cotton samples, great attention having of late years been given to cotton culture there, and apparently with success. From the Botanic Gardens of Catania alone there were 157 samples. The Director of the Royal Industrial Museum at Turin also sends a large collection of cotton, grown in 1863, by numerous cultivators; and there are also sixteen separate exhibitors of cotton. Holland makes a small display of agricultural products: there are two or three exhibitors of chicory, five of Friesland flax and codilla, one of butter and cheese, two of buckwheat, and several show tobacco.

## THE ROYAL AGRICULTURAL SOCIETY OF IRELAND.

### HALF-YEARLY MEETING.

The half-yearly meeting of the society was held on Thursday, May 25. Lord Crofton took the chair.

Present: The Duke of Leinster, Lord Clonbrock, Lord James Butler, Lieutenant-General Hall, C.B., Hon. C. J. Trench, Sir George Hodson, Bart., Phineas Riall, F. H. Lanyon, J. A. Byrne, Charles C. Vesey, William Donnelly, C.B., Hans H. Woods, G. A. Boyd, M. O'Reilly Dease, Charles Cannon, J. B. Bankhead, John B. McMahon, G. V. Wilson, H. J. M'Farlane, James Robertson, A. J. Aldrich, John Singleton, George Blake Hickson, William Lane Joynt, J. G. Dawson, James Malley, S. M. Greer, C. U. Townsend, H. Harris, S. Y. McCulloch, and E. Purdon.

The minutes of the last meeting were read and approved of. Captain Thornhill, secretary, read the following report, which was adopted:—

In presenting the half-yearly report of the society's proceedings, your council have to state that a considerable number of additional members have joined your society since the last general meeting; but they cannot avoid expressing regret that many landed proprietors, mainly interested in the objects the society has in view, still withhold their countenance and support.

The local societies, in connection with the parent one, still continue to exert a beneficial influence in promoting, throughout the country, an improved system of cultivation, and in the introduction of a superior description of stock.

Your council look forward to the approaching cattle show at Clonmel, on the 10th, 17th, and 18th August, as calculated to be of much service in that locality; and, from its central position, and the easy mode of access from the English and Scotch ports, through Waterford, a large display of stock and farming implements may reasonably be expected.

In reference to the prizes offered by your society for the best essays on the most approved mode of cultivating farms under forty statute acres in extent, your council have to report that the committee appointed to consider the same have unanimously come to the conclusion that although several of these essays contain valuable information, none of them, in their

existing state, are suitable for publication in the society's Transactions. They recommend, however, that a first prize be awarded to the essay with the motto "Agricola," and a second to that signed "Tempora mutantur, et nos mutamur in illis."

Your council have again to express their concern that the competition for the challenge cups and gold medals offered for the improvement of labourers' dwellings and farm buildings has not been more general.

The professor of chemistry, Dr. Apjohn, continues to render his valuable services. Annexed is a report of the analyses made by him during the year:—

"South Hill, Blackrock, May 22, 1865.

"Dear Sir,—In compliance with your desire, I have looked back over the chemical work done by me in 1864 for the Royal Agricultural Society, and I now forward to you a few remarks suggested by this review.

"The analyses made for members of the society were 61 in number, though a few of the materials which were made the subject of experiment came to me directly, and not through you, as secretary to the society.

"The total number of articles analyzed were, as already stated, 61, of which 28 were superphosphates, 11 guano, 6 oilcakes, and 16 various matters, not referable to any of the preceding groups. The superphosphates were, with a single exception, of excellent quality, as is evidenced by the fact of the mean amount of phosphate of lime used in the manufacture of 100 parts, by weight, of superphosphate being 38.2, the portion of this rendered soluble being 23.8, and the resulting bi-phosphate amounting to 15.8. It is fit to add that, in making this calculation, nine specimens were excluded, these being samples of the manure known under the name of phospho-guano. Had these been introduced, they would have greatly augmented the means just given, as, in the making of the phospho-guano of the year 1864, 44.91 per cent. of phosphate of lime was used, 43.48 of this was rendered soluble, and the resulting bi-phosphate reached the proportion of 27.61

per cent. This manure, in fact, viewed merely as a superphosphate, is exceptional in composition; and it is carried still further from the category of ordinary superphosphates by containing nearly 4 per cent. of ammonia.

Of the 11 guanos, only 4 were Peruvian; and, of these, three were damaged by contact with water. The remaining 7 were phosphatic guanos, containing but traces of ammonia. One of these had 25.4; another, only 10 of phosphate of lime; but the average amount of phosphate of lime in the remaining 5 was 53.93 per cent. These latter phosphates may be considered as equivalent in fertilizing action to pulverized bones, and they would also answer well for the manufacture of superphosphate.

"Amongst the six oilcakes, there was one from palm-nut, and a second from cotton-seed. The former contained a very large amount of oil (25.45), but a small quantity of the nitrogenized or flesh-forming components. The latter, on the contrary, included the normal amount of flesh-producing materials, but was deficient in oil, of which it contained but 3.4 per cent. The remaining four were ordinary linseed cakes. One of them contained a little more oil (14.3) than is usually found in seed cakes; but the average of the remaining three was only 10.5, which is, according to the experiments of Way, but little more than three-fourths of what is present in English linseed cake of average quality. All the cakes were examined for mustard, but none was found.

"As respects the sixteen miscellaneous articles, it will be sufficient to say that they comprehend eight soils, a couple of manures of low value intended for top-dressing, nodules of a phosphate of lime of peculiar composition from a Bolivian guano, cleanings of malt, a specimen of soot, a sheep-wash, and a loose variety of ore of iron, found in a bog, and consisting of carbonate mixed with the hydrated peroxide of iron.

"I may, in conclusion, observe that the artificial manure principally used in Ireland is bones, rendered partially soluble by the action of sulphuric acid; and that an interesting result of the laboratory operations for 1864 is, that the quality of the superphosphate of that year was decidedly superior to what in previous years had been prepared and sold under the same name. This is, I believe, in a good degree, the consequence of the manure trade gradually passing into more respectable hands, but may, I think, be in part attributed to the fact of the public having become at length convinced that there are chemical methods of determining, with certainty, the values and adulterations of manures, and exposing the fraudulent practices of unprincipled dealers.

"I am, dear sir, faithfully yours,

"JAMES AFJOHN."

Your council have acceded to the request of the Farmers' Club, that your accountant, Mr. Morgan, might be permitted to undertake the duties of secretary to that body, on the understanding that the books and papers connected with the club should be kept in an office set apart for that purpose, and that the duties be performed before and after the office hours of your society.

It has been thought desirable that a power should be vested in the chairman and vice-chairman to call a special meeting of the council in case of emergency; and, accordingly, the sanction of the general meeting is requested to the addition of the following words to the 12th rule:—

"The secretary shall be empowered to call a general meeting of the council at any time when considered necessary by the chairman or vice-chairman."

In accordance with the 9th general rule, ten members of your council retire from office, but are eligible for re-election. A list of members who have paid their subscriptions on or before the 1st April has been forwarded to all members entitled to vote, and also the names of all members entitled to be elected to serve.

Referring to the statement made at the last general meeting as to the grant by Government of a sum of £2,000 for the promotion of the cultivation and saving of the flax crop in the provinces of Munster and Connaught, the joint committee appointed to manage the expenditure have published and circulated their report. Copies of this document are now before you.

Pursuant to the 8th rule, your council submit the names of the following noblemen and gentlemen as office bearers for the ensuing year:—President: The Right Hon. the Earl of Do-

noghmore. Vice-presidents: Ulster—Earl of Roden and the Earl of Charlemont; Leinster—Lord Clermont and J. L. W. Naper; Munster—Duke of Devonshire and the Marquis of Waterford; Connaught—Earl of Clancarty and the Right Hon. John Wynne.

Subjoined is an account of the receipts and expenditure of your society to the 1st May, 1865, as audited by Messrs. O'Connor and Molloy, who have on this, as on former occasions, kindly given their gratuitous services.

*Annual statement of the Receipts and Expenditure of the Royal Agricultural Society of Ireland for 1864.*

	Dr.	£ s. d.
By balance to credit last account	...	47 19 3
Subscriptions received for 1864...	...	1,381 2 3
Lodged to the credit of this society by the local committee of the Sligo show...	...	500 0 0
One year's interest on £5,123 7s. 8d., at 3 per cent. ...	£149 17 2	
Three half-years' interest on £428 1s. 9d., at 3 per cent. ...	18 12 5	
Interest on deposit receipts	10 19 3	
		£185 8 10
One year's rent from the Farmers' Club (less poor rates and income-tax) ...	...	49 18 2
		£2,164 8 3

	Cr.	
LOCAL SOCIETIES—		
To money prizes to local farming societies ...	£230 5 0	
Medals for same ...	193 10 0	
		£424 1 0

SLIGO SHOW—		
Judges and veterinary surgeon's expenses ...	£125 14 6	
Mr. Corrigan's expenses and gratuity ...	19 7 0	
Secretary's expenses ...	11 5 6	
Accountant's ditto ...	6 9 10	
Premiums awarded...	606 0 0	
Printing and advertising ...	35 4 0	
Drafting catalogue...	1 16 0	
		£805 16 10

ESTABLISHMENT—		
Secretary's salary ...	£200 0 0	
Chemist's ditto ...	100 0 0	
Accountant's ditto...	73 6 8	
Mr. Callanan's gratuity ...	29 18 0	
Hall porter's wages ...	26 0 0	
Printing, advertising, and stationery ...	30 4 4	
Postage ...	22 16 8	
Rent and insurance ...	136 8 2	
Incidental expenses ...	9 12 3 1/2	
		£628 6 1 1/2

MISCELLANEOUS—		
Arrears of premiums for 1863 show ...	£28 0 0	
Expenses connected with an address to the Lord-lieutenant	2 12 6	
Expenses of judges of labourers' dwellings ...	5 10 0	
		£36 2 6
Balance to credit ...	...	270 1 9 1/2
		£2,164 8 3

Donation Fund in 3 per cent. stock	£5,551 9 5	
Examined by Finance Committee and found correct.		
JOSEPH KINCAID.		
LEONARD DOBBIN.		
HANS H. WOODS.		

Dublin, 20th May, 1865.  
We have carefully examined the above accounts, and compared the items with the vouchers produced, and have found the same to be perfectly correct.

ROBERT MOLLOY } Auditors.  
VAL. O'B. O'CONNOR }

22nd May, 1865.

## AGRICULTURAL EDUCATION.

SIR,—As perhaps many of your readers are not aware that the Royal Agricultural Society of England (in pursuance of the 7th object of their charter) are now bestowing some care upon and attention towards the subject of agricultural education, it would greatly advance their object if you would kindly insert in your next week's publication the accompanying extracts from the minutes of the committee appointed to consider the subject, together with the list of special prizes appended thereto.

Any communication upon the subject, or any assistance you can, through the medium of your valuable journal, render them, would be most gratefully received.

I am, sir, your obedient servant,

S. BENJ. L. DRUCE,

Hon. Sec. to the Education Committee of the  
Royal Agricultural Society of England.

12, Hanover Square, London, W., 3rd June, 1865.

## ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

## REPORT OF THE EDUCATION COMMITTEE.

ADOPTED 5TH APRIL.

1.—The Committee have revised the report placed before the Council on the 10th March, and have again taken into consideration the various subjects which were discussed upon that occasion.

2.—In consequence of the late period of the year at which this report has been referred back to them, the Committee cannot recommend any examination in practical agriculture in 1865, and are not prepared to advise the appointment by the Council of a Board of Examiners until a trial has been made of the existing examining bodies.

3.—The Committee recommend that a sum not exceeding £100 be given for Society's prizes amongst candidates who have passed the Oxford or Cambridge Senior or Junior Examination.

4.—That a sum not exceeding £100 be given for special subjects enumerated below,\* to candidates at the Oxford and Cambridge Examinations who have passed the Preliminary Examination.

5.—That a sum of £100 be left in the hands of the Committee for additional prizes in connection with these examinations, or for expenses attendant thereon.

6.—Every candidate shall be recommended by a member of the Royal Agricultural Society of England; and must be a person in some way dependent on the cultivation of the land for his support, or intending to make agriculture his profession.

7.—In the choice of special subjects, the Committee, being necessarily restricted to those in which candidates are examined at the Oxford and Cambridge local examinations, have made their selection with a view to the encouragement of proficiency in such branches of science as are applicable to the study of practical agriculture, and calculated to prepare the mind of the student for the proper reception of that practical education which must ultimately be completed by observation of the working of a farm, and thus enable him to test the value of such theories as may be presented to him.

8.—The subjects chosen will be especially useful to machine makers, manure manufacturers, and others who it is hoped will be attracted to these examinations, though more indirectly dependent upon agriculture for their support than the actual cultivators of the soil.

(Signed) EDWARD HOLLAND, Chairman.

EXTRACT FROM THE MINUTES OF THE COMMITTEE,  
MAY 16, 1865.

That for the purpose of prizes to be awarded in connexion with the Cambridge Local Examination in December, 1865, there be appropriated a sum not exceeding ... .. £150

That the said sum be apportioned as follows:—

1. To prizes for candidates who obtain certificates, regard being had to their place in the General Class List.

*Juniors*, a sum not exceeding ... .. £25

*Seniors*, ... .. £25

\* The special subjects referred to in paragraph four are mathematics, mechanics, chemistry, zoology, botany, or geology.

II. To prizes for candidates who (having passed the Preliminary Examination) are distinguished in any of the following special subjects:

*Juniors.*

Section 7. Pure Mathematics.

Section 8. Mechanics.

Section 9. Chemistry.

Section 10. (a) Zoology, or (b) Botany.

No Student will be examined in more than one of the two divisions (a) and (b),

A sum not exceeding ... .. £20

*Seniors.*

Section E. Mathematics.

Section F. Chemistry.

Section G. 1. Zoology, and the elements of Animal Physiology.

2. Botany, and the elements of Vegetable Physiology.

3. Geology, including Physical Geography.

No Student will be examined in more than one of these three divisions (1) (2) (3).

A sum not exceeding ... .. £30

III. To prizes for Candidates who answer papers to be set in Mechanics, and Chemistry, as applied to Agriculture. Open to Juniors and Seniors who have passed the Preliminary Examination as above, and also to any young men not exceeding 25 years of age (duly recommended).

A sum not exceeding ... .. £30

EXTRACT FROM THE REGULATIONS FOR LOCAL  
EXAMINATIONS.

UNIVERSITY OF CAMBRIDGE, DECEMBER, 1865.

1. "All candidates will have to fill up a printed form for the University. Application for these forms should be made to the Local Secretary at the place of examination before October 26. Such application should state precisely whether Forms for Senior or Junior Candidates are required."

The Examinations will probably be held at the following places, and the gentlemen whose addresses are given kindly act as Local Secretaries for their respective neighbourhoods.

Barnstable: S. Featherstone, Esq., Union Terrace School.

Brighton: Barclay Phillips, Esq., 75, Lansdown Place.

Bristol: Rev. E. J. Gregory, 2, Belgrave Place, Clifton.

Cambridge: R. Potts, Esq., Parker's Piece.

Exeter: W. Roberts, Esq., Broadgate.

Hastings: Messrs. Porter and Stewart, West Hill House.

Leeds: Barnet Blake, Esq., Mechanics' Institute, West

Riding Educational Board.

Liverpool: N. Waterhouse, Esq., 5, Rake Lane.

London: T. Bodley, Esq., 49, Upper Harley Street, W.

Lutterworth: Rev. W. Berry, Ulethorpe House.

Northampton: Rev. R. P. Lightfoot, Preston Denary.

Norwich: Rev. Hinds Howell, Drayton Rectory.

Plymouth: Rev. E. F. Tracey, Ford Park.

Sheffield: Rev. S. Earnshaw.

Southampton: Rev. A. Sells, Polygon House.

Torquay: E. Cockrem, Esq., Directory Office, 10, Strand.

West Buckland: J. H. Thompson, Esq., Devon County School.

Windsor: W. H. Harris, Esq., 4, Osborne Villas.

Wolverhampton: W. Crowther Umbers, Esq., 2, Chronicle Buildings, Market Street.

2. "These forms must be returned by November 1st, 1865, to the same Local Secretary, and with them must be re-mitted the fees, viz., the University fee £1, and the local fee (if any) charged by the Committee at the place of examination." No fee is required by the Royal Agricultural Society of England.

Candidates for the Society's prizes must be recommended by a member of the Society.

Application for forms of recommendation should be made without delay to

The Hon. Secretary,

Royal Agricultural Education Committee,

12, Hanover Square, London, W.,

from whom further particulars may be obtained on application.

## THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

## THE GENERAL MEETING.

In our last number we gave a summary of the proceedings of the Annual Meeting of the Royal Agricultural Society held on the same day in Hanover Square, the president, Sir E. Kerrison, M.P., being in the chair. The following is a full report of what occurred—

The retiring members of Council having been re-elected,

Mr. BEALE BROWNE proposed the election of Lord Tredegar as president of the Society for next year. In doing so, he observed that there was not a person in the room or out of it but would cordially agree that it would be impossible to make a better or more popular choice. Few men had done more for agriculture than Lord Tredegar had accomplished in his own neighbourhood, for at that moment the great association which was originally established under his auspices and at his expense, at Newport, rivalled the most influential of the agricultural societies in the present day (Hear, hear).

Sir W. STIRLING had great pleasure in seconding the nomination. From what he knew of the noble lord, and what he had witnessed going on upon his estate, which was managed with the most liberal and enlightened intelligence, no one could doubt his admirable fitness for the distinguished post, as all must consider it, of president of the Royal Agricultural Society for the ensuing year.

The motion was put and carried by acclamation.

Lord TREDEGAR, in returning thanks, said that when his kind friend, Mr. Torr, at the last meeting of the Council, mentioned his name as a candidate for the presidency, it took him completely by surprise; because, only a few days before, he had written to Mr. Torr, in answer to a letter from that gentleman, begging him not to put his name forward, on the ground that his numerous engagements would prevent him from giving that attention to the duties of the office which he desired. Having now, however, been so unanimously elected, all he could say was that no person in existence had the welfare of the society more at heart than he had (Hear, hear). For forty years he had been a practical agriculturist, and in his own county had done his best to forward the interests of agriculture, and they might rely upon it that he would spare no exertions to perform the duties of their President in a satisfactory manner (applause).

The Trustees and Vice-presidents were then re-elected and Mr. Hall Dare (the Secretary) read the report of the Council, which we published on Monday last.

After the reading of the report,

The CHAIRMAN explained that the £60 prizes were to be given in two half-years; not the whole sum in one payment, as might be inferred from the paragraph in the report.

Mr. J. C. MORRIS then rose and said: I wish to make some remarks in reference to the educational part of the report, and I am encouraged to do so by the intimation that the Council are not only ready to receive, but will welcome the criticism of members upon their proposal. I have no doubt whatever that the Education Committee, whose resolutions on this subject have been adopted by the Council, have studied the subject with the anxious desire that the Society should, as our charter declares, promote "the education of those who are dependent on the cultivation of the land for their support." And yet, had I been a member of that committee, I must, both on the question of order and on the merits of the case, have been one of the minority who opposed the determination to act through the University middle-class examiners, which has been arrived at. For, on the question of order, what is the education to which our charter refers? and on the merits of the case, what education is it the promotion of which is especially needed? I believe that in answer to both of these questions we must name the professional education of the farmer. And my remarks are intended to show that it is this which is referred to in the charter; and this which in point of fact especially needs our attention. Our charter specifies several objects for which we are incorporated, and they have all a direct connection with farm practice and agricultural improvement. We

are, in fact, a professional body, incorporated for strictly professional purposes. And I submit that this one educational object specified among ten others, in the definition of which a certain ambiguity or indefiniteness of expression is laid hold of, as sanctioning the idea that it is general and preliminary school training that is referred to, must be read in the light and spirit of the others, which clearly define our position as a strictly professional agricultural body. And to the same conclusion the whole history of the Society plainly points. In the outset, when it was first contemplated, the letter of Mr. Handley to Earl Spencer, and the speeches of these and other noblemen and gentlemen at the preliminary meetings, were all full of reference to the details of farm practice—all pointing to the Society having been established for their improvement. The whole subsequent proceedings of the Society, to be read in its Journal, show that this is the idea which its leaders have ever had. And the history of its achievements, written at intervals by Mr. Pusey and Mr. Thompson, plainly shows that the Society has all along been labouring within the strictly defined limits of its professionally agricultural purposes. It was on these grounds that I declared at the last general meeting, and I confidently repeat it now, that the question of general middle-class education, whether the boys to be stimulated and directed be the sons of farmers or not, is as much outside of us as the outside of Apothecaries' Hall. In a letter subsequently published, Mr. Dyke Acland has pointed out that the authorities at Apothecaries' Hall do recognise the need of a good preliminary education; for they do not admit students to their professional career except after proof that they possess a certain general educational status. But the efforts of the authorities at Apothecaries' Hall are not directed to the promotion of this preliminary education. Their efforts are directed solely to the promotion of professional education. Their prizes and distinctions are awarded not for proficiency in mathematics, languages, and so on, but for proficiency in the professional departments of study to which the students are thus admitted; and therefore it is that I believe it is exactly as the promotion of general education is outside Apothecaries' Hall, that so it is outside of the Agricultural Society. For we too might very well claim from the candidates for our honours and distinctions that they should bring with them sufficient certificates of general educational attainment, notwithstanding that it is not for them, but for proficiency in the different branches of an *agricultural* education, that our honours and distinctions should be conferred. But looking simply now to the merits of the case—what is it which the young agriculturists of this country especially need? I feel certain that any one who shall set himself to collect the testimony of intelligent observers in our country districts must arrive at the conclusion that the general educational standard has been rising for many years among agriculturists, and is likely to rise year by year more rapidly. Farmers and farmers' sons are more intelligent and better educated than their fathers were; and no whip or guidance is wanted here at all. On the subject of their sufficient professional education, however, there is no such unanimous belief. As to the practical details of farming, it is said that young men, though better educated generally, are not better farmers than their fathers were. And as regards the so-called agricultural sciences, *their* agricultural relations have been so lately ascertained and worked out that there are very few who can be said to have derived that professional benefit from an acquaintance with them which must ultimately arise. Here, then, is the educational field which is open to the Agricultural Society. Let us appoint examiners to visit any district which may invite us, with a view to the award of prizes for proficiency in these two great departments of professional education. We should then be keeping strictly within the limits of our charter. No one could accuse us of meddling with what is no affair of ours, and we should at the same time be at work where work is really wanted. I referred last Wednesday here to the fact that the country is already divided out, for the purposes of this Society, into eight or ten provinces or districts. I hope ultimately, in connection with this subject

of agricultural education, to see these districts stimulated by their own local societies collecting a sufficient sum annually within their limits for the purpose of educational rewards and scholarships; collecting, moreover, annually the names of a sufficient number of young men—agricultural students—belonging to each, whose general education shall be such as admits them to the competition for these prizes; whose rank in practical skill and proficiency shall be determined by the local authorities—partly, perhaps, by certificates from farmers; partly by actual contests in ploughing, sheepshearing, thatching, hedging, and what not, such as we have for the labouring man, whom they ought as farmers to be able if necessary to teach; and, lastly, whose agricultural intelligence and scientific knowledge shall be determined by the Society's travelling examiners. Surely our connection with some such scheme as this would be keeping more within our own proper field as an agricultural Society than that which has been so far sanctioned and adopted of asking the Universities to award the Society's prizes for grammar, mathematics, and general school attainments. I beg, therefore, to move that in receiving the report which has been presented, the Society do desire that their efforts in connection with the 7th object specified in their charter of incorporation be especially directed to the promotion of professional education. This is almost identical with a motion which I offered at the last general meeting, and which was subsequently withdrawn on the suggestion of Mr. Thompson, that the discussion ought to be satisfactory without a division, and some explanation on that point may be due from me now. Mr. Thompson's suggestion was then assented to—first, because the discussion really was satisfactory, and ought, I think, to have had more influence with the Education Committee than it has had; and, secondly, because it was felt at the time that no real progress is achieved by too rapid a decision, and that the discussion of the subject, both indoors and out, which has since been carried out, was really necessary to a fair conclusion. I feel bound to add, in the interests of this motion, which is now repeated, that although I did not venture last December to persevere in an opposition on this subject to such men as Mr. Thompson, Mr. Dyke Acland, and others, yet that it is in no spirit of mere meddling that I press these views again. I have been a member of this Society from the year of its formation, and I have never ventured to take any part in its proceedings except in this one instance of agricultural education. And I must add, that although I do not speak with any of that agricultural authority which belongs to a seat at this table, yet I have not been without the means and opportunities of forming a trustworthy opinion on this subject. For twenty-two years it has been the business of my life, my weekly professional duty, to deal with agricultural correspondence from all parts of the country, and to go wherever anything agriculturally noteworthy required examination and report, so that a picture of the actual condition of English agriculture, at least piecemeal and in part, should week by week be published. I submit it to my brother-members that an opinion of the condition and wants of English agriculture, formed in such a way as this, is not without a certain degree of trustworthiness. I would beg pardon for this egotism, but it is solely in the interests of my motion that I am guilty of it. I hope that the members of this Society will express the opinion that our operations in connection with any one of the objects specified in our charter should be directed with especial reference to the strictly professional purposes for which we have been incorporated as a Society. And to this end I have not only stated the reasons which seem to me sufficient for that opinion, but also declared the opportunities I have had of forming a trustworthy opinion of what it may be desirable to do. I beg to move: "That in receiving the Report which has just been presented to you by the Council, the Society do desire that their efforts in connection with the educational object specified in their Charter of Incorporation be specially directed to the promotion of professional education."

Mr. BEALE BROWNE cordially seconded the motion, and said he thought that education had for the last fifty years been very much at a standstill, and that among his own class a great mistake had been made in having the education of too general a character, instead of its being calculated to fit them better for the stations in life which they were called upon to fill. At the universities, also, the education was too general, as he himself had reason to know. When he first proposed

to his son that he should go to Oxford, his son said he would take his degree there, or do anything else he (Mr. B. Browne) desired; but if he were allowed to have his own way he would rather have German and other masters to teach him the living languages; "for," said he, "after you have been to Oxford, very few open a Latin book; and the dead languages are really of no use to you." He (Mr. Browne) consulted his friends upon the subject; but it was not until he happened to be in the council-room of this society one day that he came to a conclusion respecting it. He was present when some German noblemen were there; and he observed that, although several noble lords and gentlemen were seated around the table, not one of them could speak a word to these foreigners. He then felt that he would have given £5,000 to have been able to converse with them in their own tongue. That circumstance was conclusive to his mind; and, upon going back, he informed his son that he should have his tutors in German and French; and the result had fully answered his highest expectations. This he mentioned to show the vital importance of educating persons according to the stations in life which they were destined to fill. As a rule, the farmer resided in localities where the means of education were limited, the district was thinly populated, and probably the only school within his reach was the dame's school, which was attended by the children of the labourers. To this he did not like to send his sons. Consequently, the labourers were being better educated than many farmers. Indeed, he knew many a man who occupied a large farm, possessed considerable capital, and rode his hundred-guinea horse, yet could not write a letter in good English. With such material to deal with, they should not attempt at the beginning to force a high order of education; and the more that education was confined to the practical working of agriculture, the more advantageous he believed it would be. In saying this, he was confident that he spoke the opinions of nine-tenths of the members of the society, who could not be present that day. He did not want a number of Cirencester colleges established all over the country; but what he did wish to see was agricultural schools and land connected with them. He had a considerable estate, and farmed two or three thousand acres of land in Ireland. He sometimes saw some of the young men who had been educated at Cirencester, and he could testify that they were men capable of going forth and farming almost any country in the world. If they had not succeeded in every instance, it was for want of money, not for want of ability; and he was satisfied that they would turn out to be the pioneers of agricultural improvement in whatever part of the globe they might choose to go to.

Mr. EDMUNDS (Rugby), as one who had felt a deep interest in this question, thought that the society was about to take a step that was likely to prove of the utmost importance to the agriculture of the kingdom. Mr. Beale Browne had spoken strongly against a general education for farmers' sons; but, if they were not to have a general education, he should be glad to know what kind of education they were to have (Hear, hear). What use would be Cirencester College, or any other institution of that sort, unless the boy received a good general education first? (Hear, hear). It appeared to him that this subject had been going very much a-begging throughout the country. He for one could not see the difference between boys of one class and another. He believed the same education ought to be given to the sons of the agriculturist, the sons of the tradesman, and the sons of the peer, at all events up to a certain time (Hear, hear), because, when all is said and done, time comes in, in the case of the farmer's and tradesman's son, and cuts his educational career short at sixteen or seventeen years of age; whilst the son of the peer and the country gentleman continued at school until he was nineteen, and then went to college, where he remained until his twenty-third or twenty-fourth year. But the preliminary education, he maintained, ought to be the same for every boy in the kingdom (Hear, hear). Two courses were open to the Royal Agricultural Society on this important question. They might either acknowledge that education was a subject that they had to do with, or decline to have anything to do with it, on the ground that it was not embraced in the scope of their operations, and was therefore beyond them. In reference to this point, he went very far with Mr. Morton, though he could not do so all the way, for the simple reason that he should not like to check a good beginning (Hear, hear). The council has acknowledged that the subject was one with which the society

could deal. That was something (Hear, hear). But if they had resolved not to do more than offer the few figures mentioned in the report, he should regret that they offered them at all (Hear, hear). Still came the question of general education; and what he desired to impress upon the meeting was not that these figures should not be given, but that schools and the means of enabling boys to reap the advantages that the prizes would carry with them should be provided. In a paper which he lately read before the Central Farmers' Club, he urged this point upon the landowner as much as upon the tenant-farmer, because it must be to the interest of the former that his land should be well farmed; and he could not have it well and scientifically farmed unless his tenant was an educated and intelligent man. Matters stood in a very different light 20 or 30 years ago, when their produce was protected. Now they were in an entirely self-dependent position; and it was only by the application of the highest intelligence that the occupation of land could be rendered profitable. It was not simply by making all sorts of experiments, but by diffusing that common sense which would enable the rising generation of farmers to know, as the doctors said, "what to eat, drink, and avoid"; in other words, what they should adopt, and what leave alone (Hear, hear). The first duty, then, of each individual was to endeavour to provide in his own county some schools similar to those which existed in Devonshire and Sussex for the education of the future generations of farmers (Hear, hear). Farmers, tradesmen, and commercial men did not undervalue education; but they wanted to know where to get it, and it was the means of getting it that were wanted. Those schools ought to be brought home to their doors. Friends of his, who had sent their boys to commercial and chemical academies, complained that they did no good there; but upon sending them to Hurst, where education was carried on upon a system, they found that on their return, and entering a profession, the two years they had spent at school in their own county had been so much time thrown away. It was his acquaintance with cases of this kind that had induced him to urge upon noblemen and gentlemen the duty of seeing whether they could not establish schools of that class in their respective counties, and thus confer a vast benefit not only upon agriculturists as a body, but upon the people in the neighbourhood. The question now was, what ought to be done in this case? and after looking at it in every point of view, he had come to the conclusion that they would do but very little good by the prizes they were offering. He did not see, for example, how a proper competition could take place. Examinations, as now conducted, could not last long. Those of Oxford, Cambridge, or the College of Preceptors were not exactly what were required. The training at Cambridge was different from that at the sister-university. The three degrees given were not exactly the same. But if those bodies were joined together so as to form one board; if examiners were appointed from that board, and the same certificates were granted for the whole kingdom, there would be a fair competition, and a satisfactory test how far middle-class education had been successful. Under present circumstances there was no test that they were right. The test would not be precisely the same, unless the examiners were to agree upon the same number of marks, and upon the same subjects being put before the boys in the same way; otherwise, one boy of superior abilities might be successful at one place, whilst another boy of less attainments was successful at another place. The Cambridge examinations were conducted by Cambridge men, for those youths who had gone through a particular course of instruction for the purpose of taking a degree at that place. The same was the case at Oxford. Oxford men examined Oxford men. They had all the same training, and were trained up to pass the same examination. Now, for his part, he did not see clearly how this was to serve very much the cause of general education. If the object had been to interest the people so as to induce them to get a good education for their sons, the prizes offered might perhaps have some little effect. But the fact was that the people already felt a large amount of interest in the subject; and what they wanted was the means of getting the education. They wanted the school; that was the main thing; and if the proposal of the council would in any measure help to get the school, he should be the last man to hold up a finger against it. They had now made a move, and he should like to see what effect it would produce. But he feared that their prize boys would be about as useful as their prize bulls, and that for practical purposes of agriculture they would be of

little more value. He looked upon it as only a means to an end, and when they had adopted it, they would find eventually they must appoint examiners of their own, or what would be still better, assist in providing the means of a scientific education for boys 16 years of age at a cost of £40 or £50 a year, instead of £80 or £90 at places like Cirencester, which were beyond the reach of all but a few farmers. By supplying that scientific education at a reasonable sum, great good would be conferred on agriculture: it would receive an impetus that it had never before felt, and would add another to the many obligations that the Royal Agricultural Society had conferred upon the farming community throughout the kingdom.

The PRESIDENT explained that the examinations referred to in the report of the council were the middle-class examinations, which were held for scholars coming from schools in every part of the country. The examinations, though very much alike, did not come in competition one with the other, and separate prizes were awarded at each.

Mr. ACLAND, M.P.: The proposal of the council was to have two half-yearly examinations, and award the prizes at the close of two half-years of school work. Instead of appointing examiners of their own, they would avail themselves of the present examinations conducted at Christmas by Cambridge, and at mid-summer by Oxford. The boys examined by Cambridge would not compete at the same examination with boys examined by Oxford. For all practical purposes, the groups of subjects would differ only in detail. The preliminary examinations in reading, writing, arithmetic, history, and geography, had been carefully arranged by the two universities, in concert with the civil service examiners, so that the preliminary examination was in harmony with the necessary qualifications required for the civil service by the Government. The object of having a uniform standard was thus, for all practical purposes, secured. With regard to the different courses of training, both universities formed their scheme of examinations in concert with the most efficient schoolmasters, and built it up, not on the training pursued in their own universities, but upon the demands of the country, as evinced by the sort of education that existing schoolmasters were engaged in supplying to meet the wishes of parents.

Sir JOHN BOLLEAU, as chairman of the middle-class examinations in Norfolk, corroborated what Mr. Acland had stated. These examinations, he remarked, were calculated expressly for farmers and persons of that class, and he was strongly persuaded of the benefit they had been to the farmers. Many years ago he and others who thought that a better education was desirable for the agriculturist endeavoured to establish a college, with land attached to it, in his own county of Norfolk. He himself was ready to give the land, and, with others, subscribe to the college; but they could not make any way with the farmers at that time, nor, he was sorry to say, with the gentlemen either, for they could hardly get any landlords to join them. The consequence was that, when Cirencester College was set up, he had joined it with all his heart, and had lent them £15,000 to enable it to proceed, which it had repaid, and every farthing of interest since. He believed that that college ought to have succeeded; but when he came to inquire what it had effected in his own great agricultural county, he must admit that it had done nothing, and for the simple reason that the expense was too great for the farmers to incur. It was an onerous charge to the farmers living in the remote east of England to send their sons all the distance to Cirencester, and he heartily rejoiced that in the neighbouring county of Suffolk there was now established, under the patronage of his friend Sir Edward Kerrison, an institution which he trusted and believed would do much good for the eastern counties. Still, he should like to see a college or a good school in every county in England, if possible. But because such schools did not exist was no reason why gentlemen should stand with folded arms, all agreeing that education was desirable for the farmers, yet doing nothing to promote it. Many plans for this purpose had been tried, but he had never seen one that so nearly answered the object as the system of middle-class examinations. He had had some experience of that system, and in his part of the world a vast number of farmers' sons had come up to be examined. At first they got the best education they could in schools that were insufficient; but the examinations were much improving them, and the farmers were beginning to take to them very much. Very shortly, he was going down for the distribution of the prizes, and there were now



four times as many candidates as there were formerly. Moreover, they came from better schools, and these schools were still greatly improving. Indeed, the schools must improve, for the universities supplied the proper curriculum and proper men to conduct the examinations. The result was that the schools were taught by that curriculum—the masters were stimulated to put forth their best efforts; and by means of the examinations, the public soon discovered which were the best schools. He should be glad to see a greater extension of the system than that proposed by the council; but perhaps that was all that could be done at the present time, and he heartily wished it success.

The PRESIDENT said that the seventh paragraph of the society's charter stated that measures should be taken for the improvement of the education of those who depended on the cultivation of the soil for their support, and that the word "professional," used by Mr. Morton in his resolution, did not occur, or any other word of the kind. The words he had referred to were originally inserted rather with a view to encouraging the education of the labourers than of the classes above them; but, as was now well known, the State had taken special care of the labourers, and had done so much for them by grants of money and examinations, that it would be altogether superfluous for this society to offer its assistance in any way. It was therefore thought by the council that this being provided for, a certain portion of the society's funds might, with propriety and advantage, be directed, in the shape of prizes, to promote the education of the middle classes of the agricultural community. That it was a question of great difficulty was shown by the discussion which had taken place that day; and there was a great diversity of opinion even among the education committee themselves with regard to the course to be pursued. That diversity of opinion, too, had exhibited itself at the very commencement of the present discussion between the mover and seconder of the motion; for, whereas the mover spoke almost entirely of "professional education," the seconder stated that he knew of many cases in which farmers' sons were unable to read and write. At once, therefore, he suggested what lay at the foundation of all professions and callings, no matter what—namely, that the farmer's son should receive a liberal and proper education. Thus the mover and seconder positively contradicted each other at starting. What had been said by Mr. Edmunds was perfectly true. Upon the establishment in the different counties of good schools to which agriculturists could send their sons depended, more than on anything the society could do, whether they should obtain a suitable education or not. And when the Royal Agricultural Society visited Suffolk next year, they would see that there was no deficiency there; for, at this moment, out of 270 boys in the new school, 170 were the sons of farmers, paying £25 a year. In that school the boys were taught German and French, and various other things that were essential to their future occupation in life. Hereafter, lectures would be added on the practical part of farming; and the pupils would be stimulated to compete for the prizes which were offered to-day (Hear, hear). The examination would relate solely to subjects that would be useful to the boys, and include mathematics, mechanics, chemistry, physics, botany, zoology, geology, and physical geography. Moreover, they had superadded to these that papers should be set for those candidates who came up to pass in mechanics and in chemistry as applied to agricultural purposes, which were two subjects distinctly bearing upon and following the other. The great difficulty at first was that they did not feel themselves in a position to appoint examiners of their own, and were obliged to see what the existing boards could do. Upon a comparison, they found the systems of examination at Oxford and Cambridge were more alike than any other. They had therefore struck out the College of Preceptors, and intended, this year, to try how many sons of agriculturists would come up and distinguish themselves at these examinations; and he trusted they would not find that they had been altogether unsuccessful. They had only attempted it for one year, subject to such modifications as might arise, and the consideration of such opinions as had been expressed by Mr. Morton, whose able lecture of Wednesday last he recommended every member of the society to read with attention, for he had never listened to one that was more practical in his life. He had always held that the practical examination of a farmer respecting what he knew about farming was simply impossible. They might get it

done, it was true; but how would it be done? (Hear, hear). There were perhaps half-a-dozen people who might do it; but would it be satisfactory to the body whose sons were to be examined? (Hear, hear). Would they be satisfied with an examination conducted in a room or on a farm for half a-day? (Hear, hear). Would such an examination satisfy them that the boys understood the business they were to be engaged in? (Hear, hear). It had been thought that the council might stimulate education by placing itself in communication with various local agricultural societies throughout the country; and it was now on the point of addressing a circular to those societies with that view (cheers). In conclusion, he would ask the meeting to pause a little before it altogether condemned the first efforts of the council to improve education, even though those efforts might not be entirely in accordance with the views of all who listened to him; and he trusted that, having elicited a discussion on the subject, Mr. Morton would not deem it necessary to press his motion to a division.

Mr. MORTON observed that he did not object to the adoption of the report. All he contended for was, that if the funds of the society were applied to educational purposes, the professional education of the farmer should be chiefly considered.

Mr. HOLLAND, M.P., said that, as chairman of the educational committee, and also as having signed a protest against the report of that committee, he wished to say a few words on this subject. The more the committee entered into the question the greater were the difficulties that arose from various quarters. But the principle for which he had contended from the first was in accordance with the views of Mr. Morton, namely, that the funds of that society ought not to be expended in the promotion of general middle-class education. He did not say that it was not desirable that farmers should have the advantage of general education; but he maintained that that was an object which should be sought outside that society. In giving prizes for proficiency displayed at university examinations for the middle classes, they would be giving prizes for that for which certificates of merit were already conferred; and such assistance was not needed, therefore, on their part. As a society, they had nothing to do except to deal with the great question of practical and special education. He hoped, however, that the principles which had heretofore guided the council, which were repeated in the report on this subject, would continue to guide it; and he thought that the proposed experiment had taken a particular shape, and, to a certain extent, a practical one; it would be better to let that experiment be carried out in the next year. The report just presented stated that £100 was to be given in prizes to those at the Cambridge and Oxford examinations who, having passed the preliminary examination, should have distinguished themselves in certain matters. It went on to say: "In addition to these prizes, the committee are in negotiation with the authorities at Cambridge, in order that papers bearing upon special subjects connected with agriculture may be set at the next examination in December. Should these negotiations be successful, a sum of £60 will be offered for two papers, one on agricultural chemistry, and one on mechanics as applied to agriculture, which papers will be prepared by gentlemen appointed by the Royal Agricultural Society of England, and reported upon by them." Now he (Mr. Holland) thought he was at liberty to state that the negotiations with the University of Cambridge on the last mentioned points had not come to a satisfactory issue.

Mr. T. D. ACLAND, M.P., said Mr. Holland was mistaken. Everything that was asked by the society had been granted.

Mr. HOLLAND said he was not aware of that. Now, the offering of prizes (he continued) for papers on agricultural chemistry, and on mechanics as applied to agriculture, for candidates not exceeding 25 years of age, was certainly a step in the direction in which Mr. Morton and himself, and many others, wished the society to move. Here, candidates under 25 years of age were admitted to competition for a portion of the prizes; and he hoped it would be found that they had previously obtained the general education which was requisite for all. Having, however, admitted persons under that age to this kind of competition, it was evident that they must admit them also to competition for other special professional purposes. This principle was about to be carried out in Devonshire. He held in his hand a circular on agricultural education, with the names of about fifty gentlemen in that county



attached to it. These gentlemen said, "We are of opinion that, as a general rule, it is desirable for farmers' sons to commence the practical part of their training about the age of 16"—that was about the time when, in his opinion, that society ought to assist them in obtaining this practical training—"and that the advantage of examinations on the theory and practice of agriculture conducted by a central board is very questionable." So it was. But were not the Universities central boards? They sent out their examiners into different localities, and could not that society do the same thing? "We believe," continued these gentlemen, "that the same good might be done by the offer of exhibitions or other prizes to young men, with a view to encourage them to carry forward their practical training, and, at the same time, to acquire useful knowledge, provided their progress be tested by competent practical men acquainted with the circumstances of each district." That showed that those who were opposed to his views with regard to practical and special professional education were, nevertheless, prepared to get practical men to act as examiners in different localities. He (Mr. Holland) felt that the wedge was in (cheers), that they were now moving more or less in the right direction (Hear, hear), and that the wisest course was to let this experiment be tried for a twelvemonth. He would therefore suggest to Mr. Morton that he had better allow things to stand as they were, seeing that an advance was being made in a direction which tended to the benefit of agriculturists.

Mr. BEALE BROWNE observed that the medical profession had arrived at a similar conclusion to that of Mr. Morton with reference to the education of their own body.

Mr. FOWLER, of Aylesbury, then moved the adoption of the report. As a tenant-farmer—being also largely engaged in trade—he had heard a great deal in his district about the importance of having large county institutions for the education of the sons of farmers. Living as he did in Buckinghamshire, he was obliged to send his boys to Essex to be educated, and he knew several other tenant-farmers who were in a similar position. He was sure there was a general desire on the part of farmers to give their sons a good general and classical education. He was sorry to differ from Mr. Beale Browne on that subject; but he was confident that he spoke the sentiments of the tenant-farmers of England when he said what he had done. For several years past, the education of the poorer classes had been carefully attended to, and, at the same time, considerable attention had been paid to the improvement of that of the higher classes; but the education of the middle classes had been almost entirely neglected. He thought this an excellent opportunity for the society to put their shoulders to the wheel, and secure the teaching to farmers' sons something beyond the three R's—reading, 'riting, and 'rithmetic. If, indeed, something were not done in the matter, farmers would soon scarcely be able to compete with the sons of their own labourers who were trained in the national schools (Hear, hear). He believed that this was a step in the right direction; and that, at the end of the year, the Council would find that its efforts had been crowned with complete success (cheers).

Mr. HERCY, in seconding the motion, expressed his satisfaction that such an experiment was about to be made for the improvement of education, and his confidence that success would attend it.

The CHAIRMAN said, before putting either the amendment or the motion, he wished to ask the members present whether there was any other point in the report on which they wished to speak, as the adoption of it would of course embrace the whole.

Mr. W. BOTLY said he thought that, considering the state of the funds, the council would be quite justified in distributing a much larger amount in prizes than it was now proposed to do. He thought it would be a great benefit to agriculturists as a body if the society could do something to enable farmers to obtain for their sons a good middle-class education at a more moderate expense than it could be obtained at present; and as the funds were now so ample, he thought a portion of them should be set aside for the purpose of assisting agricultural schools or colleges in the various counties. Moreover, he would suggest that it might be desirable to give such assistance in proportion to the number of members of the society to be found in the several counties: that would tend to increase the number of members; and there were, he regretted to say, some

prosperous agricultural counties where the society had at present comparatively few subscribers. He should have been inclined to support the council in the appropriation of a much larger amount for the furtherance of middle-class education.

General the Hon. A. N. HOOD was happy to say that this society was in a flourishing state as regarded its finances, the capital having been doubled within the last five years; but he doubted the propriety of spending money in the promotion of general education. On the other hand, he believed that a liberal expenditure of money in assisting professional education would have the concurrence of almost all the members of the society.

Mr. EDMUNDS, of Rugby, said, when he suggested some time ago that the society should spend a thousand pounds a year for educational purposes, that suggestion was laughed at; but the council had now made a small beginning, and they might depend upon it that he and others would come there year after year to urge them forward. (Laughter and cheers.) He wished to add that there were a number of implements for which the society had been giving prizes time after time, and he could not understand for what earthly reason it had done so. For example, there was Gardner's turnip cutter. A prize had been given for that year after year. Why was that done, when the merits of the implement had been previously acknowledged, and the inventor had made one or two fortunes? (Hear, hear, and laughter.) Again, would any person who had ever turned up his land with one of them tell them that the prize ploughs at Southampton did their work as well as those which were exhibited last year at Newcastle? When they had handsomely rewarded the inventor of an implement, they should, in his opinion, wait till there was some improvement, and not go on granting rewards for the same things year after year.

Mr. FISHER HOBBS wished to say a word or two in reply to Mr. Edmunds, lest an error should go forth to the public with regard to the amount of money that was going to be given by the society for education. These new prizes amounted to several hundred pounds. (Hear, hear.) But there was one fact which Mr. Edmunds had entirely omitted to take into account, namely, that the expenses of the Journal in the last year were £2,175.

General the Hon. A. N. HOOD observed that there had also been £200 expended for the Veterinary College, and £500 for the chemical department.

Mr. FISHER HOBBS continued:—As regarded the implements, he did not think any implement was sufficiently near perfection to enable them to say that it was a model for all time. The turnip cutter, which Mr. Edmunds had just mentioned, was a very excellent implement; but practically every one who used it knew that after it had been worked a few hours it got out of order, and that a quantity of inferior work was then performed by it. Therefore he was quite sure that the Council was right in bringing it into triennial competition with other implements of the same kind. As to the Southampton plough prizes, they were won by an implement of one manufacturer, which was adapted both for light and heavy land, and for general purposes. If a comparison were made, however, between the ploughs exhibited at Newcastle and those exhibited at Southampton the latter would stand nowhere. Steam ploughing was still far behind spade husbandry; and the Council were, in his opinion, quite right in offering prizes that encouraged competition; and he believed he had with him the feeling of the practical farmers of England in saying that there was still room for improvement.

Mr. EDMUNDS remarked that he did not say Mr. Gardner's turnip cutter was perfect; he merely said that there was no use in awarding a prize year after year for the same thing.

Mr. GRIMWADE (of Ipswich) said, as a new member of the society, he wished to suggest for consideration, whether it were not possible for the meeting to come to a unanimous vote? If he understood Mr. Morton, his rider was meant to be regarded simply as a suggestion to be referred to the Council.

Mr. T. D. ACLAND, M.P., said he entirely sympathised in the desire for a unanimous vote, especially remembering what a valuable lecture was delivered by Mr. Morton on the subject of education in the previous week (cheers); but the proposal of the gentleman who had just sat down was, that after the Council had considered this subject for twelve months, after a committee had sat repeatedly and had at last come to a certain conclusion, the annual meeting should not accept the deliberate practical work of the Council, but should accept something

else, which was moved as an amendment on the report. Now it was rather difficult to get unanimity in that way (Hear, hear). Great pains had been taken to harmonise conflicting views; and what was now proposed was, that the scheme set forth in the report should be tried as an experiment. He thought there would be some difficulty in adopting Mr. Morton's proposal on account of the wording of it. He did not wonder at the revival of the discussions which had previously taken place on the wording of the charter. But it was now proposed to substitute for the words which were sanctioned by royal authority other words, namely, "professional education." Now, what was professional education? He had been in the habit of supposing that the church, the law, and medicine were professions, and that land agency was a profession, and there were many other important branches of industry in this country which were called professions. But when he turned to Mr. Morton's recent lecture, he found him defining agricultural education, and the meaning given was very different to that attached to the word "professional." Having cited testimony from various parts of England, he said similar testimony might be quoted from every county, but it was not wanted; "for," he added, "surely it must be easy to convince a man that sound agricultural education not only includes, but is instruction in the art and business of agriculture." He entirely concurred with Mr. Morton in those expressions; but he did not concur with him in thinking that professional education was equivalent to agricultural education. He thought Mr. Morton expressed himself most accurately when he said that sound agricultural education was "instruction in the art and business of agriculture;" but that was not professional education, and if the Council were to accept words now proposed without notice, it might be said hereafter that they were bound by those words, and must construe the report, as it were, in the light of Mr. Morton's words (Hear, hear). He (Mr. Acland) had no wish to enter into a long discussion, but he must allude to one matter of fact which it was important to have understood. Mr. Holland, in speaking of the prizes to be competed for by young men not exceeding 25 years of age, had said something which might lead to an impression on the part of the public that some preliminary test would be required in that case. He wished, therefore, to observe that those prizes would be open to every young man up to the age of 25, without any previous test whatever. The Council thought that, inasmuch as they gave £100 for prizes to young men who had submitted to a test of their general education, it was very desirable that young men who had been to school up to 15 years of age, and, in consequence of the school not being a good one, had acquired bad habits as regarded the minor details of education, which they had not since been able to correct, should not be excluded from competition for these prizes. It had been said that the local, or, as they had been called, middle-class examinations for schools, would receive no encouragement under this scheme of the council. As one of those who had taken an active part in the council on that question, he thought that they did not need any encouragement. They were subject to the influence of intelligent parents all over England; and hence they did not require to come to Hanover-square for encouragement (Hear, hear). But what the council thought did require encouragement was such a case as was referred to in a statement to which he would allude. About six months ago he wrote to a schoolmaster to represent to him strongly the views which were entertained by some gentlemen on that committee. He did not say a word about Oxford or Cambridge, or the College of Preceptors, or any particular kind of examinations; he simply told him that it had been proposed in that society to found examinations, and asked him whether he thought they would do any good, and what kind of examinations would, in his opinion, be best. The answer he received was to this effect: "Don't bother us with any new examinations; we have enough of them already. If you wish to do good, these Oxford and Cambridge examinations will enable you to do more good than anything else in the country, and for this reason—the standard of examination is so low, that any boy who has been at a decent school, honestly conducted, is certain to be able to pass; while, on the other hand, the variety of subjects, and the extent of the examination papers, are such as to give the ablest boy in England, or the boy who has been to the best school, ample opportunities of showing his acquirements. I therefore advise you to deal with those examinations. But," he added, "I will give you another reason. One-half of my

boys ought to go to the examinations; and I should like to send them, but I cannot, because the subjects which would help them to pass would be, among others, Latin, French, and Euclid; and I am not allowed to teach one of those subjects to any of my boys. If you want to do good, go to the Royal Agricultural Society of England, which has more influence among farmers than any other body in the country. Let that society come forward and set its seal on the teaching of such subjects as I have mentioned, and that will do an immense amount of good" (Hear, hear).

Professor COLEMAN said: Viewing the steps recommended by the council as a preliminary one, he considered it a step in the right direction. With all deference for Mr. Morton, he regarded his proposition as beginning at the wrong end; while, on the other hand, he believed they could not be wrong in taking up the question where middle-class education left it.

Mr. BRACEBRIDGE said that if Mr. Morton's proposal could be regarded simply as a rider he would not object to it; otherwise he must vote against it.

Mr. MORTON then replied. He said that no one who voted for his resolution, as he had worded it, would thereby be condemning the report. He agreed with Professor Coleman, as any sensible man must do, that they must begin with middle-class education; but the question was, what were their duties as a society? and what more could they do as a society? and it was for that reason that he wished the general meeting to exert whatever influence it possessed by forcing upon the Education Committee those further steps which it appeared they were prepared to take, but which he thought they would be more likely to take if they had the sanction of a general meeting.

Lord WALSINGHAM said he should be very sorry to prolong this discussion; but he wished to say that if Mr. Morton should persist in pressing his motion, he must hold up his hand against it. He desired to recal to the recollection of the meeting that in the charter not a single word was said about professional education, or even agricultural education. What they were authorised to do was to promote, encourage, and improve the education of those who were dependent on the soil for their support. But what kind of education? Why, the sort of education which was required by the gentlemen who had been mentioned by Mr. Beale Browne in the course of that discussion—a man who, being a large farmer and wealthy, was, it appeared, unable to write a letter in a proper manner (Hear, hear). Such a state of things was very much to be regretted. He thought it most desirable that the report should not be passed with such a rider as the motion of Mr. Morton. On the whole, he must say the Council had reason to be satisfied with the discussion which had taken place; but the adoption of Mr. Morton's proposal would be a slur on what the Educational Committee had done.

In reply to a question from Mr. GRIMWADE, of Ipswich,

The CHAIRMAN said the recent decision of the Council that the country-meeting in 1866 should take place at Bury St. Edmunds was final.

Mr. Morton's amendment, on being submitted to a show of hands, was negatived, the number being 12 for and 16 against it.

The report was then adopted.

On the motion of Mr. DRUCE, seconded by Mr. W. BOTLY, a vote of thanks was given to the auditors.

Lord FEYERSHAM said he had great pleasure in rising to move the last resolution, which he was sure would meet with the most cordial and unqualified approval of every one present. It was, that the thanks of the meeting be given to their worthy and able president, Sir Edward Kerrison, for the efficient manner in which he had discharged the important duties that had devolved upon him during the time that he had been president of that great national institution. (Cheers.) He was sure they would all agree with him that it was the greatest advantage that the deliberations of the society had been presided over by a gentleman of such ability and experience, and who had devoted so large a portion of his time, energy, and attention to the carrying out of the important objects of the institution, and to the promotion of its general prosperity. (Cheers.)

Mr. R. BARKER, in seconding the motion, said, having been present at a great many of the meetings of the council, he could testify to the admirable manner in which the president had performed the duties of his office. (Cheers.)

The motion having been put by Lord Feversham, and carried by acclamation,

The CHAIRMAN said he thanked the meeting very sincerely for this expression of feeling with regard to his conduct in the office of president. He could only say that the interests of that society always had been, and always would be, entirely his own (cheers); and he considered it a great honour and compliment that Lord Feversham, who so well filled the office of president last year, should have taken that opportunity of asking the meeting to pass a vote of thanks to him. He was particularly glad that it had so happened that, during his presidency, the society had made a commencement in dealing with the important question of education (Hear, hear). Although what had been done might not be universally satisfactory, it was, at all events, a step in advance, and he thought every one would acknowledge that it was a step in the right direction. (Hear, hear).

The meeting then separated.

#### PROFESSOR VOELCKER ON IRRIGATION.

At the weekly meeting of the Royal Agricultural Society held on Wednesday, May 31, in Hanover Square, the President, Sir E. Kerrison, M.P., in the chair, Professor Voelcker delivered a lecture on the subject of irrigation.

After some routine business had been disposed of,

Professor VOELCKER said: Last year I had the pleasure of delivering in this room a lecture on the qualities of good drinking waters, and waters used for general domestic purposes. To-day it will devolve upon me to speak more particularly of the character of waters best adapted for irrigation; and at the outset I wish to remind you that it is foreign to my present purpose to speak of the various systems of irrigation, or to enter into those practical matters of detail with which farmers who practise irrigation are better acquainted than I can possibly be. Nor do I think it incumbent on me, as your consulting chemist, to give any direct practical advice with respect to a purely practical matter. I am happy always to give advice on subjects in which I can see a connecting link between the pure man of science and the practical farmer; but I am loth to give advice on a purely practical matter, such as the application of water, after it has reached the farm, to the land. I think I can, perhaps, more profitably occupy your attention to-day by speaking on the general principles that ought to guide us in the application of water for the irrigation of land; and in doing so I must briefly allude to the great variety of opinion which prevails with regard to the cause of the efficiency of different kinds of water. Some ascribe its beneficial effects altogether to the matters dissolved in the water. We hear some asserting that none but muddy, or foul, bad smelling waters are fit for irrigation; whilst we have the trustworthy evidence of men who have applied perfectly clean and bright water with the most excellent effect to their lands. Again, we find some maintaining that water ought to be soft in order to produce a beneficial effect. On the other hand, we hear it stated that hard waters are the kind of waters best adapted for irrigation. Some ascribe the fertilizing value to the carbonic acid dissolved in the water. Others even maintain that it is the carbonic acid in the water which does the mischief which is occasionally observed. Further, the warmth of the water is by some considered the sole fertilizing agent, whilst others do not hesitate to say that the coldness or warmth of the water has nothing to do with the beneficial effects. I might have alluded to other matters, as showing that there is a great diversity of opinion prevalent upon this subject, but it is not necessary. It might not be altogether unprofitable, however, to inquire which are the right views, and which are the views that are evidently founded on misconceptions or prejudice. To render my subject more perspicuous, it would perhaps be well if we glance for a moment at the action of waters on soils. For I have noticed that in all the papers which treat on the causes of the efficiency of water for irrigation purposes, the soil is left altogether out of consideration: we hear more discussions on the quality of the water; but a very few illustrations will show you at once that it is in vain to discuss merely the qualities of water. Without reference to the quality of the soil we shall never arrive at a satisfactory conclusion as to the kind of water that is most desirable on land of a particular description. We know that in our immediate neighbourhood, on the London clay, heavy showers of rain, which in a measure

irrigate the land—for sometimes the water remains for days upon our meadow lands—have more effect than even London manure. It is a well-known fact that in bad seasons—that is, when there is little rain in the spring—manures applied to the land have no effect; and in the favourable seasons, when heavy rains fall during the spring months, manures are not required, because the rain does more good than all the manures the farmers can possibly apply to land of that stiff tenacious character which is so conspicuous on London clay. Here evidently the water dissolves the fertilizing matter out of the soil. It must render soluble a very large quantity, for we obtain a large produce of grass. On the other hand, we find that even on well-manured soils of a purely sandy character, the water, when it falls copiously in the spring, has the effect of washing-in a very great measure of soluble matters, such as nitrate of soda, and even guano. Whilst, then, on sandy land pure water does produce a decidedly beneficial effect, on other land it has the contrary effect. This shows plainly that the effect of water is different on different soils, and what pure rain-water does will also in a measure be done by natural spring waters. Let us then, for this reason, glance for a moment in a general manner at the action of water on the soil; for, as I said, it is only by considering the properties of water in connection with the properties of the soil that we can hope to arrive at a satisfactory conclusion with regard to the water which is most useful for irrigation. In the first place, I notice that water carries air into the soil. I say into the soil, for I take it to be a well-recognised principle that on irrigated meadows the water should not merely flow over the soil, but also percolate through the soil. The soil, for this reason, must be porous; not only its surface drained, but its under-drainage must be either naturally good, or rendered perfect by art. In bringing down air then into the soil, and with it fertilizing matter—ammonia and carbonic acid—from the atmosphere, it also carries along with it chemical means which render both organic and mineral fertilizing matters soluble and fit as food for plants. First, the organic matters are rapidly destroyed by the oxygen of the air: the nitrogenous matters are converted into nitrates, which we know have a most powerful stimulating effect on the growth of all vegetable produce. The nitrates, which invariably occur in all drainage waters, and which are also found in all natural spring waters, are evidently the products of the oxydation of organic matters present originally in the soil. There is a wise provision that no organic filth should accumulate. The air which is carried down in the water used for irrigation, bringing oxygen into immediate contact with those organic remains, destroys them, and converts an obnoxious material into one that is of the greatest importance as an article of food to the plant. The change which water produces on a variety of mineral matters is no less important. I just now observed that all natural water (rain-water as well as spring-water) invariably contains carbonic acid in solution. This carbonic acid acts as a solvent for many mineral matters which are insoluble in pure water. Coming from rocks that contain small quantities of phosphate of lime, it dissolves this important constituent, and renders it available for the use of the plants. Again, water charged with carbonic acid decomposes some of our natural silicates, and renders available mineral as well as organic food. Lastly, water carries warmth into the soil. It is well known to all scientific men that water possesses its greatest density at 40 degrees—that is to say, it is heaviest and densest at 40 degrees—which is 8 degrees above the freezing point of water. Therefore, water, whenever it exists in a liquid state, must always be of a considerably higher temperature than the atmosphere at a temperature just barely enough to freeze water, or even above it. Supposing the temperature of the atmosphere to be 30 degrees, we cannot find water at that temperature. It is impossible, because water has its greatest density at 40 degrees, or still 8 degrees above the temperature of ice. But, generally, the temperatures of natural springs is considerably higher at the time of the year when irrigation is most successfully practised in our fields—that is, during the spring and the colder months of the year. On an average, perhaps, the temperature of our natural spring waters may be said to be about 10 degrees above that of the air during the months in which irrigation is practised. But with regard to the temperature of our natural springs, we find indeed great variations. Whilst some are cold during the summer, they feel warm during the winter; but when tested accurately with

a thermometer, they will be found of a uniform temperature throughout the year; they are not affected by the temperature of the atmosphere. These are precisely the waters that are considerably warmer during the winter months than the temperature of the surrounding atmosphere, and I take it that such waters, other circumstances being equal, are particularly useful for irrigation purposes, as they convey into the soil, and to the roots of the plants a considerable degree of warmth. Now these may be said to be some of the chief benefits that arise, speaking generally, from the percolation of water through the soil. I pass on now to speak more especially of the most desirable qualities for water used for irrigation. Perhaps I can do this best by making some remarks on the waters in the order in which they are useful to the farmer for irrigation purposes. The best water for irrigation is no doubt *sewage water*; because it is a natural water, which contains refuse excrementitious matters, that are exceedingly useful on account of the fertilizing agents which they contain. In no natural waters do we find the amount of ammonia or the amount of phosphoric acid that occurs even in the most delicate sewage; and as ammonia and phosphoric acid, perhaps also potash, which occurs in sewage in appreciable quantities, are fertilizing matters of the greatest importance, we ought not to waste them, but apply them to the land, if possible. In percolating through the soil, the organic matters are destroyed. They are converted into nitrates, the greater portion of which, no doubt, is rapidly taken up by succulent produce, which ought, I believe, to be generally cultivated on irrigated lands. Rye-grass ought to be extensively, and perhaps exclusively, grown on soils peculiarly well adapted for irrigation, in order that the soluble matters, as soon as they become available, may be elaborated into vegetable produce, and that the good things, after being produced on the land, should not be afterwards washed. Do, however, what we will, we cannot prevent altogether the waste of a great deal of fertilizing matters in the drainage of irrigated fields. This is a great fact, well known to men who have seen the irrigated meadows on Lord Hatherton's estate at Tettersley in Staffordshire, where drainage waters are used with very great benefit indeed. And I would observe that I have strong reason for believing that drainage water is occasionally more useful for irrigation purposes than the natural spring waters of the locality. On highly-manured fields we cannot doubt that water, in passing through the land, actually takes out more in the drainage-water than it imparts to the soil. It is quite true that in other instances the water itself conveys food to the land; but when the land is highly-manured, or if the soluble matters are, as in the case of sewage, brought on the land in great abundance, a great deal of fertilizing matter will pass away in the drainage-water. In proof of this I may mention two analyses of water, that I find in the third Report of the commission which sat to inquire into the best mode of distributing the sewage of towns. That report has been recently issued, and at page 48 it is stated that the sewage on passing through the soil contained in solution 44.87 grains per gallon of sandy matter, whilst the drainage contained 37.52; thus showing that a considerable quantity of soluble matter is retained in the sewage. It is true that most of the ammonia has been absorbed during the passage through the soil; for the 5.74 grains originally present in the sewage became reduced to 1 grain; still there is 1 grain in a gallon left. What is of yet greater importance is this fact—that whilst the sewage contains no nitric acid, the drainage contains no less than 4 and a fraction per cent. of nitric acid; showing how large a proportion there was of nitrogenous matter, and even of ammonia. For I believe that ammonia is capable of oxydation and being largely converted into nitric acid, which is perhaps the very form in which it ought to be presented to the growing plant. In several drinking-waters, which, I am sorry to say, are no more fit for drinking than for irrigating purposes, I find a larger proportion of nitric acid, and indeed the presence of appreciable amounts of nitric acid can be detected in all natural springs; for which reason there is, perhaps, no water, and particularly no drainage water, which is not fit for irrigation purposes. Still, upon this subject we have very scanty information, and it is just one of those matters which I should like thoroughly to investigate. I should like to ascertain what quantity of water goes on the land in the natural rainfall, or the natural springs that are made to flow over it; what quantity passes out of the drain, and what we have in the

drainage water; because the settlement of this question will throw light upon the exhaustion of soils, of which we have heard so much. It is impossible to restore to the land with benefit what we take out of it. The natural sources of loss are far greater than the sources of loss occurring in our fields by the matters that are removed in our produce. Perhaps it will clear our ideas on the subjects of exhaustion and permanent deterioration of our fields if this subject is thoroughly investigated. I therefore purpose to go thoroughly into them, and examine not only the waters that are best fitted for irrigation, but also the drainage water; and what I stand in need of is this:—I should like some practical men who are taking an interest in this important matter to apply gauges for measuring the quantity of water that falls on the land and the quantity that passes through the drains on a given area. This would materially assist me in the inquiry which I purpose to undertake. Sewage water, then, is no doubt the most useful water for irrigation. And, whilst dwelling on this subject, I would allude to the differences of opinion that are sometimes heard expressed. Some maintain that it is a perfectly bright and clear sewage that is best adapted for irrigation. Others say that the muddier the sewage is, and the more suspended matter it contains, the better. I contend that a moderately clear sewage is better than very muddy sewage, for this reason—that sewage which contains much suspended matter is apt to produce on the surface of the soil, especially if the soil is not very porous, a silicious film, which dries and chokes up the pores of the soil, and in this way does mischief. If the coarser particles are skimmed off by the sewage being allowed to pass through a grating, and the whole suspended matter finds its way into the sewage, it will do good if the matter is properly distributed. We need not be particular in filtering the water to a nicety, but should be careful not to allow too much of the suspended matter to flow on the land, especially if it is more retentive than purely sandy porous soils, on which sewage application is most efficacious. As a matter of curiosity, I have brought with me a sample of the Maplin Sands, to which I am inclined to think irrigation with sewage will be useful. It is supposed that this sand contains some clay, not much; and also some other fertilizing matters. Passing on to another description of water, next in point of efficacy to sewage, I would observe that waters which contain a considerable quantity of the *debris* of rocks are not useful for irrigation. Nile water conveys a vast amount of fertilizing matter to the naturally sterile plains on the banks of that river. Some time ago I made an analysis of Nile water, both of water taken at the rise of the flood and of water when the flood was its height. At the latter stage the quantity of solid matter carried along is four times as great as at the time when the Nile begins to rise; and it is chiefly in the deposit of this solid matter that we have the fertilizing matter resident. Nile water, when deprived of its fertilizing matter, is a pure water, and contains only 10 grains per gallon of solid matter in solution, and perhaps the application of these muddy rivers can hardly be called irrigation proper. It is more the warping than the irrigation of land. Suffice it, then, to say that muddy streams which contain large quantities of suspended mineral, also organic matter, are chiefly useful in depositing new soil. I pass on now to another description of water—that of waters which have an equal temperature throughout the year. Water of that kind is considerably warmer in winter than the atmosphere of our fields. We have some observations made upon this point by Mr. Whitley, of Truro, in Cornwall; also by Mr. Robert Smith, who has examined several springs in Exmoor in Devonshire. I need not mention the particulars. It is enough to say that both these gentlemen are of opinion that the temperature of irrigation water during the spring months is 10 degrees higher than the temperature of the air. Thus a considerable quantity of heat is carried into our soils. Waters of a uniform temperature generally come from deep springs; and deep springs generally contain more mineral matter in solution. If water passes through a thin layer of soil or rock, it has not much time to dissolve the mineral matter. When it percolates through a large body of soil and an extensive layer of rock, it dissolves more mineral matter; and that may be another reason, and I have no doubt that on examination it will be found one of the reasons, why waters that are warm in winter are more beneficial for irrigating purposes than waters the temperature of which is influenced by that of the air. I do not think hardness in water is prejudicial to irrigation. I can, indeed, give practical evidence to the contrary. Some of the irrigated meadows

in the neighbourhood of Cirencester, and in other parts of Gloucestershire, are irrigated with very hard water, and the effect produced on them is marvellous. I can conceive that on some land the lime that is conveyed to it in the shape of water is of no advantage; and indeed the irrigation of a chalky soil with calcareous water cannot be very beneficial. But I cannot conceive how lime in water can have an injurious effect. Let me give you an illustration how apt men are, who perhaps take a little too much credit for their practical sense, to theorise, notwithstanding their strong protestations to the contrary. Practical writers on the subject of irrigation have remarked that soft waters are good, because their softness is due to the soapy constituent of potash or some kind of alkali. Now chemical examination shows that soft water generally contains no traces of alkali. It is the hard waters which usually contain the most potash and soda, for the simple reason that in order that mineral matters in the soil may be dissolved, the water must go through the soil, and that in the dissolving of lime, magnesia, and other mineral substances the potash and soda must also be dissolved. As a matter of fact I may mention that it is the hard waters that contain alkalis, and not those which feel greasy and soft; these last are soft simply because of the absence of mineral matters, such as lime, oxide of iron, and magnesia. The best spring waters for irrigation are those which contain the largest quantity of fertilizing matters, and especially of mineral fertilizing matters, in solution, and which contain also the most heat, and are thus in the best condition for yielding to the soil over which they pass both food and warmth. In conclusion, I would allude briefly to the waters which either are altogether unfit for irrigating purposes, or require special treatment to fit them for irrigation. It is a well-known fact that waters rising from peaty or boggy ground are frequently quite unfit for irrigation—that, so far from doing any good, they positively do harm. I have found it stated that it is the tannin dissolved in the water that does mischief; but this is evidently a mistake. Tannin is a substance which is very rapidly destroyed. It is one of the substances which are very readily affected by atmospheric influence. Indeed, tannin, when subjected to the action of the air, loses its tannic properties very rapidly, and care must be taken to bring those materials which we want in tanning as soon as possible in contact with liquids containing tannin. We use solutions containing tannin as a test to ascertain the presence of oxygen. Tannin, then, is evidently not the injurious thing which it is sometimes supposed to be, when it is present in peaty waters. Nor are the organic acids which are known to the chemist under the name of ulmic or humic acids as injurious in water as some have considered them. In peaty waters the quantity of these acids is but small; and it is very doubtful whether humic acids produce any injurious effect upon vegetation. But there is very frequently present in peaty water sulphate of iron, or green vitriol; and it is this constituent that does all the mischief. Waters containing this ingredient are recognized by the ochery deposit they produce in following along the carriers; and waters which deposit this ochery matter should not be used to irrigate our fields. Sometimes waters which flow through even a small portion of the soil, especially if the soil be calcareous, are deprived of this ochery matter, and become again fit for irrigation; but in nine cases out of ten it is the sulphate of iron which occurs in waters rising in peaty localities that does the mischief. I have here a sample of peaty soil (exhibiting it), in which you can see the sulphate of iron crystallizing out. My attention has been directed to the presence of sulphate of iron, rendering the soil unfertile by producing this ochery deposit, which has killed the vegetation. In peaty, mossy, and heathery soils we often find this sulphate of iron, and the waters there cannot be used for irrigation. A few days ago the Rev. Mr. Clutterbuck sent me, from his park near Abingdon, a sample of waters, which are perfectly useless for irrigation. Then, again, I would observe that waters which contain too large an amount of saline matters are injurious for irrigation. Of all waters that should not be used for irrigation, I would mention sea-water: I could adduce two or three instances, in which sea-water has been tried for irrigation, and has turned out a complete failure. For two or three years the soil has been rendered sterile by the application of sea-water. However useful salt may be as a fertilizer in small quantities, it is decidedly injurious when applied to the land in the shape of sea-water in large doses. Now,

these are some of the waters which ought not to be used. I promised at the beginning of this lecture to confine my attention to the qualities of water; and, having mentioned the qualities which are most useful and most desirable in water used for irrigation, and having also mentioned some of the qualities in water which we ought to avoid, and further alluded to some waters which are injurious on account of their deleterious substances, I think I have pretty well exhausted the subject (cheers).

Mr. P. H. FREEE said Professor Voelcker had informed them that the maximum density of water was 40 degrees. He would like to know why that was the maximum in connection with the soil.

Professor VOELCKER observed that the maximum density of water was 40 degrees. When the air was at 32, the water cooled; the water instead of becoming denser and sinking, it actually rose.

Mr. FREEE: In the soil?

Professor VOELCKER: On the top layer. Supposing the air were at 32, the water cooled down to 40. The cooling process continued; to exert its influence on the surface of the water; but then the water instead of cooling and getting denser, so that the top layer would sink and cool it, became higher, until it was at 32, when a sheet of ice was formed, which preserved the water below at 40, so that under ice they found the temperature of water 8 degrees higher than that of the air.

Sir JOHN JOHNSTONE, M.P., said that some years ago he used for irrigating purposes water that came from the moors, which proved so deleterious that he was obliged to give up using it. At the time he was under the impression that the injury was caused by the tannin in the water; and he considered it a great advantage that they had in that society an opportunity of having such mistakes corrected. The mischief was no doubt due to the ochery matter which the water deposited in the soil. He wished to add, in confirmation of something which had fallen from the Professor, that he had some meadows in the neighbourhood of Leominster, where the same water had been used three times, and the last operation seemed as successful as the first.

In reply to a question from Mr. FREEE,

Professor VOELCKER said the temperature of the soil in winter was a little above that of the atmosphere, so that the temperature of water was considerably higher than that of the soil. In some of the waters that passed through the primary rocks the amount of potash was considerable, five or six grains per gallon. That was a larger portion than occurred in sewage. No doubt a great deal of the benefit was due to the presence of potash which occurred in some natural water.

The CHAIRMAN said Professor Voelcker's lecture was very valuable, directing, as it did, the members to the different kinds of water that were most available for irrigation, and those which he especially recommended for trial. He agreed with him that hard waters, particularly such as he had seen in the counties of Dorset and Wilts flowing from chalk, were exceedingly valuable. They were, indeed, far more valuable than those soapy and soft waters which some people had supposed to produce the greatest effects in irrigation. The Professor had wisely separated what he called warped lands—that is, lands on which such deposits were formed as came from the Nile, or might be found in Lincolnshire and some other English counties—from lands to which irrigation was applicable. Irrigation, as it appeared to him (the Chairman), was, strictly speaking, the passing of water as rapidly as possible through land without leaving a film behind. He quite concurred with the lecturer that where the thinned water of sewage came naturally, if it contained its fair proportion of ammonia, it would be the more valuable for passing rapidly, and not choking the pores of the soil through which it passed. What had been said about the injurious effects of sulphate of iron and peaty waters was most important, and lectures of that kind, borne out by personal knowledge, were calculated to be most useful in preventing people from expending money on irrigation with water which would do more harm than good (Hear, hear). There was another important point, having reference to water from drains. At that moment Mr. Bailey Denton was very anxious that inquiries should be made with regard to the supply of water, which of late years had been much changed by the drainage throughout the country. That gentleman was of

opinion, and he (the chairman) thought rightly, that in some cases, in consequence of the absence of water, through its being drained away, there was less waterfall and greater difficulty in obtaining water, and that hence there was a necessity for using drainage-water more than once, in fact endeavouring to use it as much as possible. This appeared to him a very valuable hint. It was already established that water which passed through highly-fertilized land was more valuable than water which did not contain naturally much ammonia. Probably before long an inquiry would have to be instituted, both as to the manner in which the dams and various things of that kind, which had been long maintained at certain heights, should be altered, in order to enable people to avail themselves more easily of the water supply. The water now came out at a doubly and trebly rapid pace; yet there was no possible means of altering the height, because the law did not permit it. There must be an inquiry with the view of enabling agriculturists to use the rainfall more extensively than they have done. In conclusion, he must repeat that he considered the lecture which had been delivered one from which agriculture was likely to derive great benefit.

Sir J. JOHNSTON, M.P., said many of the meadows in the neighbourhood of the Ilminster called "salt meadows," were very good for fattening animals. He should like to hear from the lecturer some explanation of that.

Professor VOELCKER said he knew a good many salt meadows on some parts of the coast. The quantity of salt that was brought upon the land was very small, but it was sufficient to produce a decidedly useful effect. Indeed, he believed that the addition of some salt to sewage would be of great benefit to the feeding qualities of grass. Let it be remembered that for agricultural produce a small quantity of salt was of very great use, whilst a large dose was invariably injurious. Such a quantity as might be conveyed to land by the spray of seawater was no doubt beneficial. The chairman had made one remark to which he wished to allude. He (Professor Voelcker) believed that all refuse matters might be carried on the soil and worked into it with great benefit. Every kind of refuse should be put in the water, and then applied to the land. The effect which the soil itself had in deodorizing was really astonishing. He was led to make this remark by knowing that Sir Edward Kerrison took a great interest in the cultivation of flax. Steep-water was a very great nuisance, and the only way of disposing of it was to carry it over a moderate area of ground in the soil. All other deodorizers either were too expensive or could not practically be used. Even a small area of soil completely deodorized the most fetid liquid, and a large portion of the fertilizing matter was left in the land. On the previous Saturday he visited Mr. Marriage's farm, and was perfectly astonished to find that the water there, after passing through some fields, and being used over again twice, was brought into such a state that he would not have had the slightest hesitation in drinking it. Although it was originally sewage, it had become a better drinking water than many drinking waters which he had had sent to him to be analyzed.

The CHAIRMAN observed that what the Professor had just said about flax-water was borne out by his own experience. Some time ago he had a difficulty in getting rid of the water which came from flax, and which was most disagreeable. At last some steam pumps were put up. About 1,500 barrels of flax-water a day were now discharged on five or six acres of sandy land, and the water which flowed into the river from that land was as pure as it could possibly be.

The meeting then separated.

**MONTHLY COUNCIL, WEDNESDAY, JUNE 7, 1865.**—Present: Sir E. C. Kerrison, Bart., M.P., in the chair; the Earl of Powis, Lord Chesham, Lord Feversham, Major-General the Hon. A. N. Hood, Sir Massey Lopes, Bart., M.P., Sir Watkin Wynn, Bart., M.P., Mr. Barnett, Mr. Barthropp, Mr. Bowly, Mr. Bramston, M.P., Mr. Cantrell, Colonel Challoner, Mr. Clayden, Mr. Druce, Mr. Brandreth Gibbs, Mr. Hudson, Mr. Hutton, Mr. Jonas, Colonel Kingscote, M.P., Mr. Milward, Mr. Pain, Mr. Randall, Mr. Sanday, Mr. Robert Smith, Mr. Torr, Mr. Turner, Mr. Frere, and Dr. Voelcker.

The following new members were elected:—

Acton, William, Fern Acres, Slough.  
Adams, William, Bedford Street, Plymouth.  
Andrews, John, Ridgway.  
Bell, Thomas, Plaistow, Essex.  
Boger, Hext, 13, Lower Durnford Street, Stonehouse.  
Brown, Nath. M., Fairy Fort, near Limavady, Londonderry.  
Clark, Richard, St. Budeaux, Plymouth.  
Cleave, B. W., Newcombe House, Crediton.  
Cripps, Henry William, Parmoor, Henley-on-Thames.  
Duckering, Richard E., Northorpe, Kirton Lindsey.  
Edwards, Charles Gideon, 3, George-street, Plymouth.  
Elliott, George, Swilley Farm, Plymouth.  
Emery, Richard Ash, Lostford, Market Drayton.  
Ferguson, Alex., Government Farm, Dartmoor, Horrabridge.  
Ford, John, S., Luson, Holbourn, Ivybridge.  
Harvey, Richard, George-street, Plymouth.  
Hatten, E. C., Walsham-le-Willows, Lxworth.  
Hawker, John C., Rock, Knackerknowle, Plymouth.  
Heath, Edward O., 11, Zion-street, Plymouth.  
Howe, James, Broughton, Huntingdon.  
Hubbard, Egerton, Adlington Manor, Wimslow.  
Lang, Thomas M., Barrington Court, Ilminster.  
Larkworthy, J. L., Lowesmoor Ironworks, Worcester.  
Luscombe, William, Compton Leigh, Plymouth.  
Matcham, J., Plymouth.  
Nunn, George, H., Eldo House, Bury St. Edmunds.  
Oliver, William, Bodmin, Cornwall.  
Rendle, Robert, Catel Farm, Guernsey.  
Ridley, Matt., Grantham, Lincoln.  
Roberts, Thomas Bartlett, Morval Farm, Liakcard, Cornwall.  
Rogers, Francis Timewell, Poole, Dorset.  
Rucker, Martin D., 115, Lendenhall-street.  
Rundle, Richard, Ford Park, Plymouth.  
Sampson, Samuel, Broadwood Kelly, Winkleigh.  
Saunders, Charles, 2, Paper Buildings, Temple, E.C.  
Sharman, Warren, Melton Mowbray, Leicester.  
Smith, Robert, Blyford, Halesworth.  
Stoers, Lee, Jayes Park, near Dorking.  
Thymne, Rev. Arthur C., Penstowe, Stratton, Cornwall.  
Wadham, White, Millwood, Dalton in Furness, Lancashire.  
White, Richard, Plymouth.

**FINANCES.**—Major-General the Hon. A. N. Hood, Chairman of the Committee, presented the report, from which it appeared that the Secretary's receipts during the past month had been examined by the Committee, and by Messrs. Quilter, Ball, and Co., the Society's accountants, and were found correct. The balance in the hands of the bankers on June 30 was £2,460 2s. 1d. The Committee, having taken into consideration the length of service and increase of work of the two clerks of the Society, wish to recommend the Council to raise the salary of James Gale £20, and that of T. P. Wilkes £10. This report was adopted.

**ESSAY PRIZE.**—The successful competitor in Class IV. (1865), "On the Rise and Progress of Shorthorns," was announced to be Mr. Henry Hall Dixon, of 10, Kensington-square, W.

**PLYMOUTH MEETING.**—Lord Feversham, Chairman of this Committee, reported their recommendation that application be made to the Secretary of State for the usual force of Metropolitan Police; that free tickets be granted to the railway officials and to the press; that the Honorary Director be requested to order shedding and hurdles according to the number of entries, and to engage assistants and labourers; that placards and posters in coloured letters be issued; and that a public dinner be held under the auspices of the Society at Plymouth, the management to be arranged by the Local Committee, in accordance with the resolutions of Council of May 5, 1858, "That in future, if any dinner shall be held at the Country Meetings under the patronage of the Society, the entire management shall be vested in the Local Committee; but the Council shall have the option and power of reserving and taking such a number of tickets as they shall think fit, and this Society shall nominate the chairman and supply the list of toasts, but shall have no other liability connected with it." This report was adopted.

**SHOWYARD CONTRACT.**—Mr. Randall reported that the Committee recommended that Mr. Manning be re-

quested to deliver to the Secretary the account, both for contract and other work done at Plymouth, not later than Thursday, July 20. That Mr. Manning be requested to send in before the Show to the Secretary an offer of the prices at which he would be willing to sell to the Society the various offices, &c., enumerated in the report of the Committee on April 4, and approved by the Council; the offer to detail the price of each office, &c., separately; the Society to have the option of purchasing either the whole or any part it may deem fit. This report was adopted.

On the nomination of Mr. Bramston, M.P., Mr. George Clive, M.P., of Perrystone Court, Ross, Herefordshire, was unanimously elected a member of Council in the room of Lord Leigh, resigned.

A Committee, consisting of Lord Walsingham, Major-General the Hon. A. Nelson Hood, Mr. Barnett, Mr. Barthropp, Mr. Bowly, Mr. Clyden, Mr. Dent, M.P., Mr. Druce, Mr. B. T. Brandreth Gibbs, Mr. Wm. Fisher Hobbs, Mr. Holland, M.P., Mr. Hudson, Mr. Jonas, Mr. Milward, Mr. Pain, Mr. Pope, Mr. Randell, Mr. Rigden, Mr. Robert Smith, Professor Smonds, Mr. Torr, Mr. Turner, and Mr. Wallis, was appointed to recommend the names of Judges of Live Stock at the Plymouth Meeting;

and a committee consisting of Earl Cathcart, Lord Cheaham, Major-General the Hon. A. Nelson Hood, Hon. A. H. Vernon, Sir E. C. Kerrison, Bart., M.P., Sir A. K. Macdonald, Bart., Sir W. Miles, Bart., M.P., Mr. Amos, Mr. Arkwright, Mr. Barnett, Mr. Cantrell, Colonel Challoner, Mr. B. T. Brandreth Gibbs, Mr. Hamond, Mr. Wm. Fisher Hobbs, Mr. Holland, M.P., Mr. C. Wren Hoskyns, Mr. Randell, Mr. Sandy, Mr. Shuttleworth, Mr. Thompson, M.P., Mr. Torr, Mr. Owen Wallis, and Professor Wilson was appointed to recommend the names of Judges of Implements to a Special Council which would assemble on the 21st inst.

On the motion of Major-General the Hon. A. N. Hood, seconded by Mr. Druce, the Council decided on permitting Mr. Charles Sturgeon to exhibit two Merino Rams in their wool.

The Common Seal of the Society was affixed to the agreement with the Mayor and Town-Clerk of Bury St. Edmunds, that the Country Meeting for 1866 should be held at that town.

The Council then adjourned to Wednesday, the 14th inst., at 12 o'clock, when Dr. W. Budd will deliver a lecture on a Disease in Pigs lately prevalent in the Western Counties.

## NORFOLK AGRICULTURAL SOCIETY.

This society had its annual gathering on Thursday and Friday at Norwich, June 15 and 16. Norwich boasts of the *ruin urbe* element, and the committee conceived the novel idea of holding the show in the pleasant open space known as Chapel Field. Accordingly, in the heart or nearly in the heart of the somewhat sleepy old city, which we suppose may be fairly termed the capital of East Anglia, there was to be heard the hum and whirr of implements, the buzz of a large mass of persons, and occasionally the neighing of some lively "entry" in the horse classes. The field was screened, of course, from the public gaze by a boarding carried all round it, and up to 5 p.m. on the first day the charge for admission was placed at the somewhat stiff figure of 2s. 6d. The attendance was nevertheless large, for there is still happily a considerable section of the agricultural public to whom half-a-crown is no great matter. We are disposed to take some little credit for having ventilated in 1858 some notions as to the position then occupied by the society, which had for several years been marching from Norwich to Swaffham and from Swaffham to Norwich, while very little interest was taken in the operations of the association by numbers in Norfolk—farmers who never came under its influence. A year or two later the peregrinatory principle was adopted, and the society has since visited Dereham, Yarmouth, and Lynn. The result has certainly been that the show has taken a new lease of life, as the meeting of Thursday and Friday proved this. The edges of the field were devoted to implements, and the stock of all kinds was placed in well-arranged rows of open sheds, a large space being left at one end of the enclosure, which was useful as an arena in which to exercise the riding-horses. The general effect was so good that one enthusiastic visitor was heard to remark—and he was a gentleman of some experience, too—that it was almost as good as "the Royal." But when the excitement of the moment has cleared off, it must be admitted that there is abundant room for further progress on the part of the Norfolk Society, as the number of entries of stock was more than 100 below that at the meeting of the Essex Society at Brentwood, the latter being all the while only in the eighth year of its existence. Moreover—although this remark will also apply, to some extent, also to the Essex show—the Norfolk Society was largely indebted to Suffolk breeders for swelling out its catalogue, which, by the way, is still a very badly-arranged affair, no information being given as to the names of prominent bulls, cows, or horses, while there was also an absence of any details as to

sires, "g.g.s.," or "g.g.g.s." It was in horses and pigs that the Suffolk element especially made itself felt; while in sheep the large landlords and the professional breeders, as we may be permitted to term them, pretty well crushed out any representation of enterprise existing in this regard among tenant farmers, although four or five ventured to "run the blockade," and did so in one or two instances with success. In the cattle and horse classes there was more "unrestricted competition," to recall the celebrated phrase into which "free trade" imperceptibly glided some years since. The society seems very economical in the matter of judges, only one, Mr. Ladds, being allowed for shorthorn cattle; one, Mr. Keary, for other cattle; one, Mr. Lugar, for Southdown sheep; one, Mr. Garne, for long-wooled sheep. Mr. Clyden of Littlebury was entrusted with the duties of judge of cart-horses; but his functions stopped short rather abruptly at the Norfolks, which a Norfolk man took in hand—to wit, Mr. Blomfield of Hockfield. Mr. W. C. Spooner was judge of hackneys, and Mr. Thurnall of Royston of thoroughbred sires and hunters. The judges had, too, to perform their duties after the gates were opened, and with a continually increasing pressure of visitors about them.

Mr. Frere of Royston won the first prizes in the Shorthorn bull class with a long and well-bred animal, as will be readily appreciated when we state that he was an offshoot of the excellent Babraham herd. A good three-year-old bull was shown by Lord Walsingham, bred by Mr. J. Banks Stanhope of Revesby Abbey, near Boston. In yearling Shorthorn bulls the first prize animal was descended from Lord Lovell, a bull which was very fortunate at the Yarmouth show of the society in 1863. The yearling is of the same colour as Lord Lovell, that is, white; and considering his age, must be pronounced a very precocious animal. Lady Pigot took the principal prize for Shorthorn cows with an entry rather more than three years old, and from the Towneley herd: she was a fine level, well-clothed beast, but too fat. This cow took a prize last year at the meeting of the society at Lynn, as did the second cow now prized, a handsome roan shown by Sir Edward Kerrison. The cow to which the judge passed the third prize was a fine animal, but flat in her ribs. In Shorthorn in-calf heifers an elegant entry with excellent colour, and everything in her favour, secured the first prize to Mr. H. Aylmer. Lady Pigot was awarded the first place in somewhat younger heifers; but had to cede the *pas* to Lord Walsingham in yearlings. So much for the Shorthorns. The polled Norfolks appeared to great advantage al-



though Mr. Keary, the judge, would like to give them a dash or two more Devon blood. Lord Sondes has devoted—at any rate through his agent, Mr. Fulcher—much attention to this class of animals; but he was left behind by Sir W. Jones, who exhibited a very symmetrical but somewhat sluggish and dull animal. This entry brought back to Sir Willoughby a £7 cup which he had offered in the class without any restriction as to horns or slugs. In polled cows the first two premiums were taken by Suffolk breeders for two large, well-rounded cows. The polled heifers attracted a good deal of notice. Lord Sondes took the first prize with a heifer which figured well, both as regards colour and form. In yearlings Mr. Brown of Thursford was more fortunate. The form is still kept up of giving prizes for Devons, and there was rather more competition than usual; still the honours remain with Mr. Blomfield of Warham. The entries were very small in size, and there are not wanting critics who contend that these ill-filled Devon classes ought to be suppressed. The other breeds comprise one or two Alderneys, and a Hereford bull shown by Mr. W. A. Gilbert, of Cantley, and bred by the Duke of Bedford, that attracted some notice.

The sheep classes were somewhat meagre. As we have already hinted, there is no encouragement offered to small breeds to put in an appearance when they have to deal with such an overwhelming opponent as Lord Walsingham, where shearing Southdown rams swept off all the prizes. A yearling ram which took a cup given by the Norwich corporation—for on this occasion, at any rate, the Norwich "people" came forward with some spirit—was a level, long, and generally well-formed animal which may perhaps figure advantageously even at Plymouth. A good pen of Southdown ewes was shown by Lord Sondes, but the other Southdown classes provoked the remark heard the other day at Brentwood, that Southdowns are becoming very small—a serious matter to those who have, and who has not? a partiality for a Southdown leg of mutton. Mr. Butler, of Barney, restored, however, the balance to some extent with some very large half-bred lambs, very little older. There were also some good large half-bred wethers, and some useful Oxford Downs. If the Southdowns produced in Norfolk are small, the longwooled sheep are colossal; no other epithet can be applied to Mr. Aylmer's extraordinary two-shear sheep. Mr. Aylmer had, as usual, a formidable opponent in Mr. T. Brown, who made a clean sweep of all the prizes for shearing longwooled rams. There were no longwooled ewes exhibited, but the longwooled classes were nevertheless generally interesting. In a remote corner there were a few swine, where Mr. Stearn and Mr. Mumford Sexton reigned almost supreme. Mr. Hugh Aylmer pushes his pretensions even here, however: Shorthorns and longwools do not content him; but he is now attaining a certain degree of success even with pigs.

We have now only to speak of the horses, by which the Norfolk show of 1865 will probably be the best remembered. Year after year a plaintive lamentation has been raised in quest of the old Norfolk hackney, the clever Norfolk hackney, the dear old Norfolk hackney, which we used to remember, and so forth. This year the hackneys seem to have reappeared in force, and they were put through their paces in a large ring. Capital action was displayed by several animals; but the award of both first and second prizes was made in favour of Mr. Grant, of Woodridge; so that the first and second-prize hackneys were Suffolk hackneys after all. As regards the pedigree of these animals, it was impossible, in the excitement of the moment, to ascertain it, and all the information vouchsafed by the catalogue—very defective on this head—was "unknown." The lot of weight-carrying hunters was a good one; the show of stallions was also creditable, and there were two or three which were considered calculated to get good hunters. A prize for riding-horses was won by a stylish animal, bred, it was understood, by Col. Wale, of Little Shelford. A handsome cup was given by Lord Hastings for hunters, four years old, entered with hounds last season; and Mr. Villebois, the late master of the West Norfolk, followed suit with another cup for colts or fillies a year younger. The entries which took these prizes promise to develop in first-class horses. There was a good pony class, in which the first prize went to an entry seventeen years old, but still a wonderful one to go. Several of the other ponies shown were exceedingly pretty to look at, but appeared of doubtful strength. Two of the best classes of riding horses, however, were those for stallions, Captain Barlow getting justice at

length done to his beautiful thorough-bred horse, whose want of a place at the Essex show caused so much talk. There could be no doubt, however, as to the bone and muscle of the agricultural stock. Old Chester Emperor, shut out at Brentwood by his past successes in Essex, cleared another £22 10s. for Mr. Badham, who also carried off a few other prizes with mares and fillies. It will be seen, however, that Mr. Clayden threw a little cold water on some of the Suffolk cart entries at the dinner. In three year old *bond fide* cart-stallions, a powerful and thick-set bay, which has come on well during the past year, took the first prize. In the older stallion class some rather clumsy animals from the fen districts received prizes. The pairs of cart-horses and cart-mares, however, were the chief features of the agricultural stock, and the prize lots were distinguished by high excellence in respect to colour, symmetry, substance, and strength: they elicited, in fact, unreserved expressions of admiration. It is gratifying to see the horse classes—once so weak at this Norfolk show—acquiring every year more and more importance, and to observe how the competition increases in them.

There was a fair show of implements, entries being made by Mr. Alfred Dodman, Lynn; Messrs. Ransome and Sims, Ipswich; Mr. D. Crowe, Gaywood; Messrs. F. M. Blyth and Co., Norwich; Messrs. Sparke and Co., Norwich; Messrs. H. and J. Cutlack, Ely; Messrs. Randell and Sons, North Walsham; Messrs. R. and R. Hunt, Earl's Colne, Essex; Messrs. Watts and Riches, Norwich; Messrs. Murton and Turner, Kenninghall; Mr. J. Baker, Wisbech; Mr. N. Rix, junior, Newgate-street; Messrs. Branford and Son, March, Cambridgeshire; Mr. T. Bradford, Manchester; Mr. C. Burrell, Thetford; Messrs. Woods and Cockedge, Stowmarket; Messrs. Holmes and Sons, Norwich; Mr. R. S. Baker, Lynn; Mr. W. P. Wilkins, Ipswich; Mr. E. H. Bentall, Heybridge Works, Maldon; Messrs. Samuelson and Co., Banbury; Messrs. Garrett and Sons, Leiston; Messrs. E. R. and F. Turner, Ipswich; Messrs. Coleman and Morton, Chelmsford; Messrs. Barnard, Bishop, and Barnards, Norwich; Messrs. J. and J. R. Rawlings, Melbourne, Cambridgeshire; Mr. G. Cubitt, North Walsham; and Mr. W. C. Thurgar, Norwich. There was no particular novelty on the ground, although the names of the makers are a guarantee for the general excellence of the lots on offer. The performances of several traction engines excited, as usual, a good deal of wonderment; although it is very doubtful whether this system of locomotion is making any real progress.

The dinner was served with some confusion, in consequence of a sudden pressure of guests; but as the evening advanced everything shook down comfortably. The Marquis Townshend presided, supported by the Earl of Albemarle, Lord Sondes, Lord Walsingham, Lord Suffield, and a large number of county notables; but for brevity's sake, we must draw the line at peers. Although we are on the eve of a general election, and the rival candidates for West Norfolk and several of their leading supporters were present, everything passed off quietly and agreeably. A number of complimentary speeches having been disposed of, Mr. Keary, who was called upon to respond for the judges of cattle, and who was for many years associated with the great Holkham estate, although he now hails from Shropshire, diverged into more practical topics. Mr. KEARY said he had first the honour of acting as judge for the society some 22 years since, and he thought in this long interval every class of animals had much improved in Norfolk, with the exception of the North Devon cattle: that class had cut a bad figure in the show-yard, however, although a beautiful polled cow, which he considered the gem of the yard, was by a Devon bull. He could not but think that before the North Devons were entirely exterminated from the county the breeders of Norfolk and Suffolk polls would do well if they gave them a few dashes of blood from that breed; by so doing they would have animals with much greater aptitude to fatten, without losing the good milking qualifications which the Norfolk and Suffolk polled cattle possessed. If Norfolk had not pursued a system of crossing, especially in sheep, it would not have held the high position in the agricultural world which it now maintained. As a proof of the advantage of crossing he would call attention to a pen of fat lambs (exhibited by Mr. Butler), which gained the prize for half-bred lambs; these lambs, he was assured by one of the judges of sheep, would be worth 50s. to 58s. each on Norwich Hill on Saturday.—SIR WILLOUGHBY



JONES, who had won the prize for the best Norfolk polled bull, returned thanks for the successful exhibitors. The hon. baronet said he did not for a moment profess to put Norfolk polls, handsome and good as they were, in comparison with Shorthorns; he looked upon the difference between them to be as great as between a trotting hackney and a thoroughbred stallion. He thought the Norfolk polls were extremely good in their way. He heard cries of "No, no;" but he thought shorthorn cows were like articles of vertu, and that Norfolk polls must be put into a totally different category from those noble animals which formed the aristocracy of the cattle tribe. He did not go the whole length with Mr. Keary as to crossing; he did not wish to see any further dash of Devon blood in the Norfolk polls, for by Devonizing the latter they would breed away their milk. What he liked about the polls was, that from poor thin pastures they would give a full pail of milk, which he did not believe any other class of cows would do. The polls also displayed an aptitude to fatten, were capable of subsisting upon weak grass, and could bear keen east winds. This was the kind of animal Norfolk wanted. With regard to the crossing of sheep he went all lengths with Mr. Keary; he had a thoroughbred Southdown flock, but it was a luxury and nothing else.—Mr. CLAYDEN responded for the judges of horses, and said that he had been compelled to discard some of the Suffolk animals from a want of soundness and activity. The pairs of plough-horses were generally excellent; but when he tested their walking powers, he found that the animals to which he had awarded the prizes greatly surpassed the rest.—Mr. THURNALL, another of the judges, said he had always been taught in his district (Cambridgeshire) to look upon Norfolk as a rather out-of-the-world place for fox-hunting. In very few counties, however, could there be found such a show of weight-carrying hunters. It might be advisable, however, to have a certain fixed age in all the hunter classes, say five years old. Sometimes a regularly screwed-up horse worth 400 or 500 guineas, and another which would never be worth more than 200 guineas although younger, were brought before a judge; and he in that case to give the prize to the most valuable horse, or to that which was the best model of a hunter? An alteration in this respect would benefit the show and assist the judges.—Mr. SPOONER expressed his satisfaction at the reappearance in the showyard of Norfolk hackneys, which would beat the world. In no county in England would such fine action be witnessed as he had had the pleasure of seeing that day. He had found some animals which, although possessing three extremely good legs, had a fourth a little defective. This the ordinary bystanders might not have observed, because some of the Norfolk hackneys could go better on three good legs than others on four. He mentioned this to ward off a little of the censure which some gentlemen might perhaps be induced to throw upon the judge of hackneys. Mr. Spooner in conclusion enforced the importance of careful attention to breeding.—Mr. H. AYLMER returned thanks as a successful exhibitor of pigs, and said he thought the animals exhibited contradicted an assertion made in the *Mark Lane Express* that there were no good pigs in Norfolk. At the same time, Mr. Aylmer must admit that a great proportion of the prizes went somehow into Suffolk hands. However, all the more credit to him for endeavouring to raise the character of Norfolk, even in the matter of pigs!

We believe we have now pretty well touched upon all the points of agricultural interest mooted in the course of the long June evening which the meeting sat out. The show was financially successful: 2,300 persons paid 2s. 6d. on Thursday, and 1,200 paid shillings. On Friday, 2,900 paid shillings, and 5,000 paid sixpences. This represents a total receipt of about £620, while the receipts at the largely attended meeting held at Lynn last year were £635.

#### PRIZE LIST.

##### CATTLE.

Judges.—W. Ladds, Ellington, Hunts (Shorthorns).

H. W. Keary, Bridgforth, Salop (Devons).

Shorthorn bulls.—First prize of £10 to G. E. Frere, Roydon; second of £3 to Lord Walsingham; third of £5 to Sir E. C. Kerrison.

Yearling Shorthorn bulls.—First prize of £8, and Norwich Corporation Cup of the value of £12 10s., to Lord Walsingham; second of £5 to J. How, Broughton, Hunts. Highly commended, Lady Pigot.

Devon bulls.—Prize of £10 to J. Blomfield, Warham.

Norfolk and Suffolk red polled bulls.—First prize of £10 to Sir W. Jones; second of £5 to Lord Sondes. Commended, H. Birkbeck and J. Savory, jun.

Yearling Norfolk and Suffolk red polled bulls.—Prize of £5 to Sir W. Jones. Commended, J. Smith, Crownthorpe, and B. Brown, Thursford.

Bulls, not being Shorthorn, Devon, or Norfolk and Suffolk red polled. Prize of £8 to W. A. Gilbert, Cantley.

Shorthorn cows, in-calf or in-milk.—First prize of £10, and Norwich Corporation Cup of the value of £12 10s., to Lady Pigot; second of £8 to Sir E. C. Kerrison; third of £4 to H. Aylmer.

Devon cows, in-calf or in-milk.—Prize of £5 to R. J. H. Harvey, Crown Point, near Norwich.

Norfolk and Suffolk red polled cows, in-calf or in-milk.—First prize of £8, and Lord Sondes' cup of the value of £7 7s. 6d. to S. Walton, Newbourn; second of £6 to Sir E. C. Kerrison; third of £4 to Lord Sondes. Commended, H. Birkbeck, Stoke Holy Cross; B. Brown, Thursford; Sir W. Jones, Cranmer; and Sir E. C. Kerrison.

Cows, not being Shorthorn, Devon, or Norfolk and Suffolk red polled, in-calf or in-milk.—First prize of £8 and silver medal to H. Overman, Weasenham; second of £4 to L. J. Palmer, Snetterton.

Polled cows or heifers, in-calf or in-profit, not being Norfolk and Suffolk red polled.—Mr. A. Hamond's premium of £5 to F. Sutton, Great Plumstead.

Shorthorn in-calf heifers, not above three years old.—Mr. W. Bagge's premium of £5 and silver medal to H. Aylmer, West Dereham.

Shorthorn heifers, in-calf or in-milk, under three years old.—Prize of £8 and silver medal to Lady Pigot.

Yearling Shorthorn heifers.—First prize of £4 to Lord Walsingham; second of £3 to Lady Pigot.

Devon heifers, in-calf or in-milk, under three years old.—Prize of £5 and silver medal to J. Blomfield.

Norfolk and Suffolk red polled heifers, in-calf or in-milk, under three years old.—First prize of £6 and silver medal to Lord Sondes; second of £5 to Sir W. Jones. Highly commended, R. J. Oliver, Docking, and Lord Sondes.

Yearling Norfolk and Suffolk red polled heifers.—First prize of £5 to B. Brown, Thursford; second of £3 to Lord Sondes. Commended, Sir W. Jones and B. Brown.

Heifers, in-calf or in-milk, not being Shorthorn, Devon, or Norfolk and Suffolk red polled, under three years old.—Prize of £5 and silver medal to H. Overman, Weasenham.

Fat steers of any breed, above three years old.—Prize of £8 to J. Tingey, Ellingham.

Fat steers of any breed, under three years old.—First prize of £6 to R. Worley, Suffield; second of £3 to W. T. Simpson, Attleborough. Highly commended, W. T. Simpson.

Fat cows or heifers.—Prize of £5 and silver medal to J. Blomfield.

##### SHEEP.

Judges.—H. Luger, Hengrave, Suffolk (Southdowns).

R. Garne, Aldsworth, Gloucestershire (Longwoolled).

Shearling Southdown rams.—First prize of £8, silver medal, and Norwich Corporation cup of the value of £12 10s., to Lord Walsingham; second and third prizes of £5 and £3 to Lord Walsingham. Commended, Lord Sondes.

Southdown rams of any age.—First prize of £5 and Mr. Styleman Le Strange's premium of £5 to Lord Walsingham; second of £3 to Lord Walsingham; third of £3 to J. Overman.

Shearling Southdown ewes.—First prize of £5 and silver medal to Lord Sondes; second of £3 to J. Overman, Burnham Sutton.

Southdown ewe lambs.—First prize of £4 and silver medal to Lord Hastings; second of £3 to Lord Sondes.

Southdown wether lambs.—Lord Walsingham's premium of £5 and silver medal to Sir W. Jones. Commended, Lord Sondes.

Southdown shearling ewes.—First prize of £3, the Earl of Leicester's premium of £5, and silver medal to Lord Sondes; second of £5 to E. Farrer, Sporre. Commended, Sir W. Jones.

Shearling long-woolled rams.—First prize of £8 and silver medal, second of £5, and third of £3 to T. Brown, Marham. Highly commended, H. Aylmer.

Long-woolled rams of any age.—First prize of £8, Norwich Corporation cup of the value of £12 10s., and silver medal to H. Aylmer; second of £5 to T. Brown; third of £3 to H. Aylmer. Highly commended, H. Aylmer.

Long-woolled ram lambs.—First prize of £5 and silver medal to T. Brown; second of £3 to T. Brown.

Wether lambs of any other breed.—Prize of £5 to J. W. Butler, Barney.

Ram lambs, not being long-woolled.—Prize of £4 and silver medal to J. W. Butler. Highly commended, J. Hammond, Bale.

Shearling wethers of any breed. First prize of £5 and silver medal to A. Overman, Egmore; second of £3 to A. Overman.

Ewes of any age or breed.—Lord Sondes' premium of £5 and silver medal to Lord Sondes; second of £3 to Lord Sondes.

Ewes of any age or breed, not being Southdown or long-wooled.—Prize of £8 and silver medal to H. Overman, Weasenham.  
 Shearling ewes of any breed, not being Southdown or long-wooled.—Prize of £5 and silver medal to H. Overman.

## CART HORSES.

**JUDGES.**—J. Clayden, Littlebury, Essex (except Norfolk).  
 C. Blomfield, Hockwold, Norfolk (Norfolk).  
 Cart stallions not under four years old.—Messrs. Gurney and Birkbeck's premium of £12 10s., first prize of £10, and silver medal to G. D. Badham, Bulmer Tye (Chester Emperor); second of £7 to E. Gilbert, Blofield.  
 Two-year-old cart stallions.—Prize of £8 and silver medal to W. Branford, Whissonsett.  
 Cart mares.—First prize of £10 and silver medal to S. Walton, Newbourn, Suffolk; second of £8 to G. D. Badham, Bulmer Tye; third of £4 to Sir E. C. Kerrison. Highly commended, J. N. Waite, jun., Martham.  
 Three-year-old cart fillies.—Prize of £8 and silver medal to G. D. Badham.  
 Two-year-old cart fillies.—First prize of £5 to Sir E. C. Kerrison. Highly commended, G. D. Badham.  
 Cart foals.—First prize of £5 and silver medal to J. N. Waite, Martham; second of £2 to G. D. Badham.  
 Pairs of cart horses for agricultural purposes.—The Melton Constable Cup of the value of £20, given by Lord Hastings, and silver medal, to J. Tingey, Ellingham; second of £8 to J. Smith, Crownthorpe; third of £4 to J. Tingey. Highly commended Sir T. P. Beauchamp, and W. A. Gilbert, Cantley.  
 Norfolk cart stallions, not under four years old.—First prize of £10 and silver medal to T. Wright, North Runciton; second of £7 to G. O. Cresswell, Appleton.  
 Norfolk cart stallions, three years old.—First prize of £8 and silver medal to G. Stanham, Hethersett; second of £5 to W. A. Gilbert, Cantley.  
 Two-year-old Norfolk cart stallions.—Messrs. Harvey and Hudson's premium of £12 10s., first prize of £8 and silver medal to C. Edwards, Stow Bardolph; second of £4 to W. Waters, Stokesby.  
 Norfolk cart mares.—Messrs. Gurney's and Birkbeck's premium of £12 10s., and Mr. G. P. Bentinck's premium of £5, first prize of £5 and silver medal to R. Gillett, Halvergate; second of £3 to C. Edwards, Stow Bardolph; third of £4 to J. B. Aylmer, Fincham.  
 Three-year-old Norfolk cart fillies.—First prize of £8 to R. Gillett, Halvergate; second of £3 to R. Gillett.  
 Two-year-old Norfolk cart fillies.—Prize of £5 and silver medal to B. J. Kendle, Weasenham.

## RIDING, HUNTING, &amp;c., HORSES.

**JUDGES.**—W. C. Spooner, Eling House, near Southampton (Hackneys).  
 H. Thurnall, Royston, Cambs (Thorough-bred Stallions and Hunters).  
 Thorough-bred stallions.—First prize and silver medal to F. Barlow, Hasketon; second of £8 to Lord Hastings. Highly commended, Sir T. P. Beauchamp. Commended, H. Westropp, Long Melford.  
 Stallions, for saddle or harness.—First prize of £10 and silver medal to T. L. Reed, Downham Market; second of £8 to F. Barlow. Highly commended, H. Birkbeck, and the creators of the late W. Wright, Tring.  
 Riding mares or geldings, above 15 hands and an inch high.—Premium of £5 5s. given by the Mayor of Norwich, and prize of £3 given by the Society, to Sir W. Foster. Commended, Sir W. Foster.

Hackney mares or geldings, above 14 hands and not exceeding 15½ hands high.—Messrs. Harvey's and Hudson's premium of £12 10s. and the Earl of Leicester's premium of £10, to J. Grant, Woodbridge; premium of £5 5s. given by the Sheriff of Norwich to J. Grant; third prize of £3 to R. Gittus, jun., New Buckenham. Highly commended, G. D. Badham. Commended, G. Jacobs, Watton, and the Mayor of Norwich (Mr. C. E. Tuck).

Mares or geldings, for hunting purposes.—First prize of £5 to J. Grant; second of £3 to T. Edwards, Keswick.

Four-year-old colts or fillies, hunted in Norfolk last season.—The Melton Constable Cup, of the value of £20, given by Lord Hastings, and silver medal, to W. Goulder, Wimbotsham.

Three-year-old colts or fillies, for hunting purposes, bred in Norfolk by exhibitors.—Mr. Villebois cup, of the value of £20, and silver medal, to Craeske Rope, Bury St. Edmunds. Commended, R. B. Aylmer, Westacre.

Brood mares, for saddle or harness.—Mr. J. H. Gurney's premium of £5 and first prize of £3 to R. B. Aylmer; second of £5 to H. G. Nelson, East Somerton. Commended, G. Stanhaw.

Ponies, not under 12 nor above 14 hands high.—Lord Stafford's premium of £5, and the Norwich brewers' cup of the value of £10 10s., to R. J. Kendle, Weasenham; second prize of £3 to J. A. Ransome, Ipswich. Highly commended, J. A. Ransome. Commended, C. Crawshaw, Bingham; Bullard and Sons, Norwich, and E. Larke, Wymondham.

Weight-carrying Norfolk cobs, not under 13½ nor above 14½ hands high.—Premium of £5, given by the *Norwich Mercury*, to L. J. Palmer. Commended, G. M. Sexton and G. Barnard. Donkeys, used in Norfolk for agricultural purposes.—Lord Hastings' premium of £5 to C. Waters, Ashlee.

## SWINE.

**JUDGES.**—H. P. Jones, Portway House, Warminster, Wilts.  
 Breeding sows, of large breed.—Prize of £4 and silver medal to G. M. Sexton, Wherstead, Suffolk.  
 Boars, of small breed (black).—First prize of £4 and silver medal to G. M. Sexton; second of £2 to S. G. Stearn, Brandon, Suffolk. Highly commended, G. M. Sexton.  
 Breeding sows, of small breed (black).—First prize of £4 and silver medal to S. G. Stearn; second of £2 to G. M. Sexton. Highly commended, S. G. Stearn and C. M. Sexton.  
 Boars, of small breed (white).—First prize of £4 and silver medal to H. Aylmer; second of £2 to G. M. Sexton. Highly commended, S. G. Stearn.  
 Breeding sows, of small breed (white).—The Norwich brewers' cup, of the value of £10 10s., and silver medal, to H. Aylmer.  
 Breeding sows, of small breed (black).—Prize of £4 and silver medal to S. G. Stearn; second of £2 to S. G. Stearn.  
 Breeding sows, of small breed (white).—First prize of £4 and silver medal to S. G. Stearn; second of £2 to S. G. Stearn.  
 Store pigs.—Prize of £4 and silver medal to S. G. Stearn.  
 Litters of pigs, on the sows.—Prize of £3 and silver medal to S. G. Stearn. Highly commended, J. N. Waite, junr., Martham.

## IMPLEMENTS.

**JUDGES.**—H. B. Caldwell, Lackham House, Chippenham, Wilts.  
 Collections of Implements for the purpose of agriculture.—The Norwich innkeepers' cup, of the value of £12 12s., to Holmes and Sons, Norwich; second prize of £8 to Riches and Watts, Norwich; third of £4 to Murton and Turner, Kenninghall. Silver medal to Riches and Watts, for corn-grinding mill. Highly commended, Woods and Cocksedge, Stowmarket, for pulper; and R. Baker, Lynn, for swing press roll.

## THE OXFORD AND BANBURY AGRICULTURAL SOCIETY.

## MEETING AT OXFORD.

As is the case with many local societies, the united Oxford and Banbury has had its vicissitudes, and for the last two or three years looked very like declining. The meeting at Oxford, however, on the 14th of June, afforded some very satisfactory signs of resuscitation, as there was not a section of the show but that was creditably maintained, whether one turned to cattle, sheep, horses, or pigs. The exhibition, moreover, had not to depend upon any outside aid; but its chief merit rested the rather upon the entries of such stock as are identified with the district: as, for instance, the classes of Oxfordshire Down were really capital. These sheep are gradually getting to more uniformity of type, while they have that

use on the farm and value to the butcher that should ensure the sort being carefully cultivated. The Duke of Marlborough's first and second-prize pens of ewes with lambs were of extraordinary excellence, and, at all points, about the pride and pick of the whole show. Mr. Bryan, of Southleigh, was first and second also amongst the shearling rams, with a couple of square, handsome sheep, of high quality; but Mr. Wallis' old ram, which won at Hereford last week, was deservedly pronounced the best of any in the two classes, and his owner received the extra premium accordingly. We spoke to the merits of the Shifford flock in our report of the West of England show, though the winner there and at Oxford had pre-

vionously distinguished himself as the third-prize shearer at the Royal meeting at Newcastle. Mr. Joseph Druce took second here in the old rams; but, in some proof of the strength of the competition, we should say that both the classes of Oxfordshire Down rams were *generally commended*. The Blenheims were first again as shearing ewes, with a clean, handsome pen of sheep; while amongst the Cotswolds, of which there was a fair but not a great entry, we found also some further echo of last week's awards. Mr. Gillett's first-prize shearing ram was also first at Hereford, and his highly-commended sheep second at Hereford, one of Mr. Cother's now separating the pair; but with the Oaklands flock taking both prizes for old rams, and the ewe-class resulting in no competition whatever. Beyond Messrs. Gillett and Cother, the only other exhibitor was Mr. King Tombs; and there appears to be an increasing disinclination with the Cotswold breeders to exhibit, some of the most successful, as it is said, declining to face the Royal Meeting at Plymouth. Of course this is a mistake, or, as the managing man of one of the leading implement firms well put it, when explaining as to there being neither premiums nor trials at Oxford for machinery, "We come here at some cost; but we can't afford to stop away."

Mr. S. Smith, of Somerton, and Mr. Sabin, of Cullworth, both handy home, also undertook to place the pigs, as well as the sheep, and with another very good entry to adjudicate over. The Berkshire was the prevailing breed, and the class of sows under fifteen months old, all of this sort, was so good as to gain a general commendation. Mr. Allender was first with a sow that would have stood better at Hereford had not the heat or the journey upset her; and the other sows exhibited by Mr. Bailey, of Swindon, Mr. William Hewer, Mr. Joseph Druce, Mr. King Tombs, and Mr. John Hutt were all noticeable for their high and uniform character, so that such a victory was really worth something. The older sows were not so generally superior, the only really clever one being Mr. Hewer's, though she was merely commended, the preference being given to a long-headed, lop-eared, old-fashioned sow of Mr. Joseph Druce's, that had certainly a wonderful litter on her—a consideration that no doubt turned the award in her favour, as, for pig for pig, the Sevenhampton entry was all over the better of the two. Mr. Bailey had no competition to encounter with the old boars, but in the younger class Mr. Hewer won with another famous specimen of his breed, further pronounced to be the best of all the boars, and thus becoming entitled to receive one of those extra pieces of plate which the gentlemen of the county scatter so liberally through the prize-sheet.

The show of cattle, or, in other words, of short-horns, was by no means of such even excellence, but a few good animals set-off by a number of a very inferior description—a contrast which indeed would seem to be becoming a somewhat noticeable feature in any exhibition of this particular breed. A few years since, this would not have been a matter of much surprise; but with the lesson now so continually read to us, it is curious to see the many highly-bred culls that are still forced on for exhibition. Neither of the two old bulls could have won against any further competition, though the award of the two premiums created a deal of discussion. An old bull of Mr. Henry Middleton's was placed first, while another, exhibited by Mr. Hewer but bred by Mr. Sanday, was necessarily second. The latter, at half the age of his opponent, is of a finer character; but, having met with an accident when a calf, shows a certain weakness of loin—an infirmity which, the judges maintained, his broad hips would much conduce to, let alone any actual mishap; and hence the decision arrived at. Mr. T. Garne's

Gondomar, a bad second at Hereford, was now the best two-year-old, mainly from there being no entry against him; but another Mr. Garne from Churchill Heath did a deal better amongst the yearling bulls, where he showed far away the best animal on the ground. This was "Duke of Towneley," picked up as a calf at the Towneley sale, when very poor and bad from the scour, at fifty-five guineas, but who has been going on favourably ever since, and is by this showing a young bull full of promise. With a deal of masculine character about him, of a rich whole colour, with good hair, and of beautiful quality, he has length and depth, fine square quarters, and plenty of other points in his favour. Of course he was the best bull in his class, with a premium of five guineas; the best of all the yearlings, with a cup valued at another five guineas; the best horned animal, with another five-guinea cup; and the best horned animal exhibited by a tenant-farmer, for which a fourth premium of five guineas would go to still further gladden the heart of Mr. Garne, in the shape of one more silver cup! Mr. King Tombs was second here with the same young bull that was second at Hereford, for which there is not much to be said, and Mr. Hewer highly commended for another of no great appearance. Mr. Thomas Garne took first for cows with a smart, well-fed beast, getting bad about her quarters, and Mr. Allender second with one in really breeding condition, and that has quite a character for such a class at her back—"Lapwing, 5 years and 9 months old, has produced 5 calves." "Gazelle," the property of Mr. George Garne, and the best heifer in milk or in calf, is square, deep, and stylish; and the Rev. C. Holbech's second-best, "Duchess of Brackley," has length, looks, and quality in her favour. Over the placing of the yearling heifers there was some more talk, and possibly with more reason, as at first sight the judges, Mr. J. Robinson of Clifton Pastures, and Mr. Henry Higgins of Woollaston, took all to a very pretty well prepared heifer of Mr. Holbech's, but that they fancied less and less as they pulled her to pieces; as, indeed, had it not been for the referee called in, it is said she would not have been second. Mr. George Garne's "Portrait," the ultimately preferred of the bench, is a meanish heifer, with a good loin, but finishing off badly in her quarters, while it is only fair to say she was not in the high condition of "The Princess," who had dropped terribly in her carcass, and may probably not go on as well, though on Wednesday the more complete animal to the eye, as the more kindly to the hand. Mr. Hutt of Water Eaton took the cup for the best pair of heifers with one good and one merely middling youngster; and the same herd was first in both classes of dairy cows, with the rev. Joseph Dodd also second in either. In the Extra Stock, Mr. George Garne took a premium of £4, Mr. Hutt one of £3 for a cow of fine character, and Mr. Joseph Roberts two premiums of £2 each with a couple of sweet heifer calves, bred by Mr. Walter Strickland of Cokethorpe.

The same pair of judges were not long in disposing of the horse section of the show, where they gave "the fiver" for the best brood mare for hunters to an old cheanut of Mr. Godson, highly commending a far more clever grey of Mr. Stallworthy's, which unfortunately went lame; not much of a fault, after all, in the stud, if traceable to work rather than hereditary causes. Mr. Hurleston's cart mare was a great, weighty, clever animal, with a fine foal; and Mr. James Paxton's second-best of lighter stamp, also with some good about her. There was no entry in the cart stallion class, but an extra prize of a sovereign was given to a very middling roan exhibited by Mr. Hutt; and five pounds, with more showing, to a very clever promising three-year-old hunting horse by North Lincoln, and exhibited by Mr. G. M. Allenden, who has thus got beyond his rising reputation for Berkshires. The Duke of Marlborough also sent on to the ground his Clyde stallion, ac-

complicated by a flash, coaching sort of horse, though said to be thorough-bred.

We have already referred to the merely accessory position of the implement department, where Pickles and Sims, the Nalders, Bradford, Gibbons, Harwood, Dean, of Woodstock, Browning, of Oxford, and some other local

dealers and agents, made up a very creditable show in the centre of the ground, but with no call for criticism on our part. The proceedings of course were wound up with a dinner, at which Sir H. W. Dashwood was announced to preside, supported by some of the M.P.'s, one or two of whom were also on the show-ground.

## SALE OF THE GRAND DUKES AND DUCHESSES AT WILLIS' ROOMS.

June the 7th was a great day for Mr. Bolden and all the Bates men, not to say Duchess 51st, and "J. Brown's Red bull (97)." We have seen sale luncheons under every aspect. A rough canvas tent with some beef joints, cheese, and cans of ale or cider, once did good duty at them. Since then they have risen into an era of many dishes, sherry and flower-clad barns, till at last Mr. Stratford has treated the Grand Dukes and Duchesses as real instead of personal property, and hiring Willis' Rooms, has invited his bidders and the public to a high-art *déjeuner à la Russe*.

It is said that "there is nothing new under the sun;" but this sort of reception certainly was, and as the season of the year suited, even men who knew that they would be infallibly out of their price range before the bid-dings had begun, found a good excuse for coming up to London, to attend such a Shorthorn *levée*. The council board of the Royal Agricultural Society was promptly deserted at a few minutes to one, and the weighty question of appointing judges for Plymouth had to stand over for another fortnight. Everything was fair on such a day, especially after the rumours which had been "flying all abroad," about the forthcoming fight of the capitalists for the females. Mr. Stratford had himself indicated Mr. Betts as one of the combatants in the "triangular duel." It was known that Colonel Pennant had offered £6,000 in vain for the twelve, and therefore it was pretty certain that he would take his part; but if the rumour which pointed to a Yorkshire Lord as the third, did not prove correct, a substitute unexpectedly started up, in Mr. Geo. Moore, an eminent silk merchant, of Cheapside, and of White Hall, in Cumberland, who had never bought a Shorthorn before, and was "anxious to begin well." We might with truth have asked ourselves, in Sir James Graham's old election phrase, "What will they say at Cocker-moath?" if he had come up on the outside and won. However, it was plain, after the first three lots, that Mr. Betts had made up his mind to have all four, and it was good taste in his opponents to draw off, and not "punish" him for his public spirit.

The chair was taken shortly after one o'clock by Lord Eversham, supported by General Hood, Col. Kingscote, Mr. Bramston, M.P., Mr. Barnett, Captain Gunter, Mr. Taqueray, Mr. Combe, Mr. Drake, and one or two others at the cross-table. Mr. Torr and Mr. Thomas Booth were there, fresh from the Waraby valuation, to watch the fortunes of the Grand Duchesses, in which they can claim such a strong interest through the pure Booth, Bredcake. Mr. Bolden looked in, to see the fine judgment, which he brought to bear on the breeding of the tribe, have its full fruition at last in his life-time, and received a warm recognition from those few, who amidst the genial glow of a "guinea lunch," and the popping of champagne corks, happened to observe him enter the room. We saw no one from Ireland, save Colonel Leslie, M.P.; and Mr. Barclay was for a time the sole representative of our Shorthorn friends over the Tweed. Still, when we exclude Ireland, and say that we looked in vain for the Duke of Montrose, Baron A. de Rothschild, Colonel

Towneley, and Messrs. Eastwood, Pawlett, Young of Keir, Stratton, Mitchell, Carr, Housman, Sharpe, Smith of Whittingham, and Cruickshank, there were very few leading herds that were not represented. If a photograph could have been taken of a very interesting scene, we can only state that in addition to those we have mentioned already and hereafter, portraits of Aylmer (two), Biddell, Barthropp, Bowly, Clayden, Downs, Downing, Doig, Davis, Dale Trotter, Freeman, How, Howard (J. and C.), Jefferson, Knowles, Lister, Little, Leney, Longland, Macintosh, Noakes, Rich, Robinson, Randell, Savidge, Slye, Storer, Snewing, Staniforth, Sturgeon, C. Sanders, Thompson, Tracey, Jacob Wilson, and Waldo, &c., would have been found in it.

About 104 sat down in all, and Viscount Strathallan, the Speaker of the House of Commons, Mr. Foljambe, accompanied by two well-known present and ex-M.F.H.'s, Mr. George Lane Fox, and Mr. Wicksted, dropped in along with Mr. Heathcoat and a few others shortly before business began. The noble chairman gave "Her Majesty and the Prince of Wales," and then introduced the serious business of the afternoon in his preface to the third and last toast, the health of Mr. Stratford. In doing so, his lordship went back to the late Mr. Bates, and his hopes and successes, his "anxiety that others should possess the blood—if they would only give the price" (cheers and laughter); and gave his own experience as one of his disciples. He recounted that he had twice over given 300 guineas for Bates' bulls, one of them a mere calf, and never regretted it, and dwelt upon the fine mellow handling, good skins, and gaiety, &c., of the sort. "As for their not being good breeders," his lordship continued, "I only know that I have so many calves that I can't rear them, and my farmers do not leave them long on my hands."

Mr. Stratford thought it best to fuse his two speeches into one, and in a minute or two after his lordship sat down he was aloft on a table, with two assessors, or what they call in Scotland "judges of the sale." Some of the windows were shut up, to deaden the roar of the great Babylon without; "enter Mr. Thornton with writing table and materials from the left wing," and the first act of the new sensation shorthorn drama began. It seemed strange that the scene should be laid within a stone's throw of "the sweet, shady side of Pall Mall," instead of a ring under a sycamore, and harvest waggons all round it. Still, if not a bull or cow was in sight, Dawpool had not lacked a stream of visitors, with notebooks and pencils, for some weeks before; and not a few could have undergone a rigid examination on all the 6 D points, as well as their pedigrees for fifteen generations, which, as a clergyman observed, "just read like mathematics." To make things complete, it was arranged that if any change had taken place there, or a cow "broke," the news should be "wired" to Willis' at once. Thus in one of his opening sentences, Mr. Stratford was enabled to say that it was now about two o'clock, and that there was a clean bill of health in Cheshire at half-past twelve.

He then jocularly disclaimed taking any advantage of

the good lunch, on the ground that "good things will always sell anywhere and anyhow." He divided his audience into three classes—those who had more purse than spirit, and *vice versa*, and those who had both; and dwelt on its being "a classic tribe," begun long before his own time, and nearly 200 years before the birth of Charles Colling. Respecting the two last bull calves, he then made a clean breast of it. They had been kept in new buildings, built on damp Liverpool sandstone, and were both "rheumatic, or gouty, or groggy, as some people call it." *Grand Duke Ninth* was so afflicted, but only in his fore legs, while *Grand Duke Fifteenth* was a much more hopeless case, and "never likely to get better." The biddings were then settled at 20 gs. for the female lots, and 5 or 10 gs. for bulls; and Mr. Strafford added that he had earnestly desired to carry out the late Mr. Hegan's wish of selling the whole as a lot, and then putting up what bulls the purchaser did not care to keep, but that such heavy "penny-post pressure" had been put on him that he had divided the females into four lots of three.

The first lot contained *Duchess Fifth*, *Seventh*, and *Eighth*, two of them own sisters, all of them red, and by *Prince Imperial*, and all served by *Imperial Oxford* (18084). The *Fifth* is a red cow with well-sprung ribs, plain rump, and long horns, has had five calves, and is five months gone in calf again. The *Seventh* has unfortunately become a most doubtful breeder, and three years ago Mr. Bolden sold her, with a caution on that head. She is thick and heavy fleshed, wide and deep, with a fine breast and of a rich colour. The *Eighth* was the crack cow of the lot, as well as the youngest by a few months, "red and all red," and the dam (in addition to a couple more) of Col. Pennant's *Duke of Geneva* and Mr. McIntosh's *Fourth Grand Duke*. She is especially lengthy and well made, with a good bag, and just springing for calving, and some Dawpool pilgrims spoke of her as a "lovely cow."

"There was silence still as death,  
And the boldest (qy. Bolden) held his breath  
For a time,"

as Mr. Strafford, after exhorting his friends right and left of him to do their duty, poised his glass, and asked "What for the first lot?" "*Four hundred*," was the response of the gallant owner of the Weatherby Duchesses, who sat between Mr. Tanqueray and Colonel Kingscote at the top table, and Mr. Drewry covered him in an instant with five hundred; and on they went, 800, "a thousand"—the bold Drewry again—1,100, 1,200, till our pencil could hardly stagger after them. Mr. Betts' or his agent's biddings came from the centre of the room; Mr. Drewry poured in his fire right under the table, with two more canny Cumbrians (Mr. George Moore and Mr. Foster of Kilhow) as his supports; and from a knot close by the door, which consisted of Colonel Pennant, Captain Oliver, Mr. Roberts, and Mr. Barclay, we heard the well-known decisive tones of The Captain, at seventeen or eighteen hundred. We are told that both he and Mr. Drewry said "*Eighteen*," but there was the remorseless "*Nineteen*" on their track in an instant; and the "*Kentish Fire*," whose ravages Mr. Strafford had foreshadowed as he stood like a prophet of the grove at Penshurst, fairly silenced both Cumberland and Wales. There was a tremendous volley of cheers. "*Who's Hammond?*" some one enquired; and the right name soon went round, and buyers saw their fate. Then we passed on to Lot 2, and Mr. Strafford protested, by way of interlude, "They may blow me up as much as they like now for liking the Duchesses."

Lot 2 had *Ninth*, *Thirteenth*, and *Eighteenth* in it of the Cherry cross. *Ninth* is a red roan daughter of Fourth Grand Duchess, poor in her condition, but very like breeding. She has had three calves already, and milks well; but

she is rather spoilt by her horns, one of which is down. Her own sister, the *Thirteenth*, is a white, well-made, but perhaps hardly a Duchess in the touch or muzzle. *Eighteenth* is a thick-fleshed calf, but still she is rather loose in her growth and down in her back, which spoil the effect of other good points. All this had been duly weighed, but still the first bid was six hundred, and there were some very cheerful biddings—1,000, 1,050, 1,100, 1,200, 1,300, and then the glass ran out. "*Who's Mr. Lancaster?*" was the query; and "He's an agent, and what's more, his master can pay for them," was the significant reply, which was being interpreted "Betts again." Still Wales and Cumberland were determined to have a third try, and there were another lot of reds awaiting them.

"Now we'll try Lot 3rd," *Tenth*, *Fifteenth*, and *Seventeenth*, "dam and two daughters, both by *Imperial Oxford*," and there was a rare rustling of catalogue leaves. The *Tenth* was one of the best of the dozen, with great length, well-sprung ribs, a deep but not an especially wide chest, but slightly plain about the setting-on of the tail. The horns of *Fifteenth* are rather erect, and her loins might be better, but still she is a pretty good one on the whole, and nice in her hair; while *Seventeenth* is also good on that point, as well as in her looks and length, but hardly up to the mark in her handling. The bidders, however, were up to the mark, and it was 600 guineas all over the room, and they were soon landed at 1,800 guineas. In vain did Mr. Strafford do his best to push them another fifty; and there was nothing for it but to say that "They are Mr. White's, and not a green man I'll warrant." It was the "old, old story," and those who had made champagne bets that the average would be above 400 guineas, were pretty sure of winning when they saw 5,000 guineas down for the three times of asking.

Lot 4, or *Eleventh*, *Twelfth*, and *Fourteenth*, were all daughters or grand-daughters of Grand Duchess 4th. The roan *Eleventh* had a big knee, and not exactly the character of the Duchess tribe about the head, but still useful and good, and dam of Grand Duke 18th. The *Twelfth* was a very nice but poor heifer, which had been to Duke of Geneva, at Penrhyn, the previous month; and the *Fourteenth* was a peculiarly true-made red, neat, and with good hair, but small for its age; and, in fact, when it was three weeks old it only scaled 33 lbs. Beyond the 1,200 guineas at which they were put in there was not one single bid, and "*They're Mr. Watson's*" was only another—and we think an eccentric—form of saying that they had joined the company of the other nine. Pencils went busily to work, and while Mr. Strafford was actually expressing his willingness to be a devoted martyr for his Duchess love, and bringing down the house with assurance that "If you can ever send me a finer lot of Almack's Belles I'll sell them in the ball-room upstairs," the "sum total" was found to be £6,510 for twelve, or an average of £542 10s.

There was very little breathing-time given, and *Imperial Oxford* (18084), the American-bred bull, was at once in the ring, at least in the spirit. He is a good-tempered one, in nice condition, and with capital hair and quality, and remarkably clever hind-quarters; but he might have been deeper in the flank, and perhaps a little lighter round his muzzle. Captain Gunter again led the way with 400 gs., and then left it to be carried on by Mr. Betts and another (who gave in at 440 gs.), and 10 gs. more secured their old consort for the Grand Duchesses once more. For some reason or other, which we can only attribute to good generalship, Mr. Strafford let the next two lots stand over, and brought out *Tenth Grand Duke*, a red bull two years old within a week, with grand quality, and good in his arms, head and horn and hind-quarters, but not quite the thing in his girth. He boldly observed of him that

a thousand was under his value, and a very merry fire opened at 300, and went on with all manner of advances from three or four quarters; but Mr. Drewry stayed longest, and at 600 the premier was scored down, amid great cheering, to the Duke of Devonshire. *Thirteenth Grand Duke* was a good-ribbed one, but faulty and plain in some other points; still a gentleman at the door was most resolute, and sent him along between the whiffs of his cigar up to 310 gs., when he was declared to have passed to Mr. T. Walker, of Birswell Hall, near Coventry. With him the heavy biddings of the day closed, and harking back over leaf we got to *Sixth Grand Duke*, a useful, plain sort of bull, with a fine crest, but a little bare on the back, of good quality, and carrying his head well. Mr. G. Bland, of Coleby, bid stoutly for him, and he went to Lincolnshire at 130 gs.

Then we descended into the regions of rheumatism; and Mr. Strafford told how Mr. Atherton had offered in vain 100 gs. for *Ninth Grand Duke* when he was only a few days old. He is a heavy-fleshed bull, of fair quality, and with a good deal of Booth about him. The complaint is only in his fore legs; but Mr. Atherton would only say half of his first bid now. There was no other bidding; so Mr. Strafford "felt" the executor as to whether he should not be thrown in among Mr. Betts's lot; but that gentleman only bowed, and said he was "acting for others." At last Capt. Gunter spoke up, after consultation with Mr. Knowles, and eventually bought him at 100 gs. for a friend. It was no use dwelling on *Fifteenth Grand Duke*, nice calf as he is, and he was therefore withdrawn altogether; and the average for five bulls was £883 18s. Colonel Pennant had taken advantage of the option given him on hiring *Eleventh Grand Duke* to buy him at £525; but leaving him out of the question, the whole amount realized that afternoon was £8,179 10s., or £481 8s. each for seventeen. As *Grand Duchess Seventh* is looked upon as a mere beef purchase, we may fairly take it that if she is put at 100 gs. for the 100 to 1 chance, *Grand Duchesses Fifth and Eighth* averaged 900 gs. each. Those who thought that Captain Gunter did wrong in not recently selling to Mr. Betts an in-calf *Duchess* with her last calf at her side, must allow that he did not over-estimate the market price of his article. We know of nothing to compare with the prices of this day, except when the late Mr. Richard Booth refused 15,000 gs. for his whole herd. The proceedings were all over by four o'clock, and the following is the list of the prices:

## COWS AND HEIFERS.

*Grand Duchess 5th*, red, calved April 23, 1858; got by Prince Imperial (15095), dam (Grand Duchess 2nd) by Grand Duke (10284), g.d. (Duchess 51st) by Cleveland Lad (3407).  
*Grand Duchess 7th*, red, calved December 10, 1858; got by Prince Imperial (15095), dam (Grand Duchess) by Grand Duke (10284), g.d. (Duchess 51st) by Cleveland Lad (3407).  
*Grand Duchess 8th*, red, calved March 12, 1859; got by Prince Imperial (15095), dam (Grand Duchess 2nd) by Grand Duke (10284), g.d. (Duchess 51st) by Cleveland Lad (3407).

Mr. Betts, 1,900 gs.

*Grand Duchess 9th*, red roan, calved December 28, 1859; got

by Grand Duke 3rd (16182), dam (Grand Duchess 4th) by Cherry Duke (12589).

*Grand Duchess 13th*, white, calved January 15, 1863; got by Grand Duke 3rd (16182), dam (Grand Duchess 4th) by Cherry Duke (12589).

*Grand Duchess 18th*, red, calved September 16, 1864; got by Imperial Oxford (18084), dam (Grand Duchess 9th) by Grand Duke 3rd (16182).

Mr. Betts, 1,300 gs.

*Grand Duchess 10th*, red, calved August 4, 1860; got by Grand Duke 3rd (16182), dam (Grand Duchess 5th) by Prince Imperial (15095).

*Grand Duchess 15th*, red, calved May 28, 1863; got by Imperial Oxford (18084), dam (Grand Duchess 10th) by Grand Duke 3rd (16182).

*Grand Duchess 17th*, red, calved September 16, 1864; got by Imperial Oxford (18084), dam (Grand Duchess 10th) by Grand Duke 3rd (16182).

Mr. Betts, 1,800 gs.

*Grand Duchess 11th*, roan, calved January 5, 1861; got by Grand Duke 3rd (16182), dam (Grand Duchess 4th) by Cherry Duke (12589).

*Grand Duchess 12th*, roan, calved July 5, 1862; got by Imperial Oxford (18084), dam (Grand Duchess 9th) by Grand Duke 3rd (16182).

*Grand Duchess 14th*, red, calved May 7, 1863; got by Grand Duke 4th (19874), dam (Grand Duchess 11th) by Grand Duke 3rd (16182).

Mr. Betts, 1,200 gs.

## BULLS.

Imperial Oxford (18084), red, calved August 16, 1860; got by Grand Duke 2nd (12961), dam (Oxford 13th) by Third Duke of York (10166).—Mr. Betts, 450 gs.

*Grand Duke 6th* (19876), red, calved October 25, 1861; got by Faust (16083), dam (Grand Duchess 2nd) by Grand Duke (10284).—Mr. G. Bland, 130 gs.

*Grand Duke 9th* (19870), roan, calved August 13, 1862; got by Grand Duke 3rd (16182), dam (Grand Duchess 5th) by Prince Imperial (15095).—Captain Gunter, 100 gs.

*Grand Duke 10th*, red, calved June 12, 1863; got by Grand Duke 4th (19874), dam (Grand Duchess 9th) by Grand Duke 3rd (16182).—Duke of Devonshire, 600 gs.

*Grand Duke 13th*, red, calved September 14, 1864; got by Imperial Oxford (18084), dam (Grand Duchess 11th) by Grand Duke 3rd (16182).—Mr. T. Walker, 310 gs.

*Grand Duke 15th*, rich roan, calved November 21, 1864; got by Grand Duke 4th (19874), dam (Grand Duchess 12th) by Imperial Oxford (18084).—Not sold.

## SERVICE LIST:

NAME.	DATE.	BULL.
Grand Duchess 5th .....	Dec. 23 .....	Imperial Oxford.
————— 7th .....	Nov. 10 .....	" "
————— 8th .....	Sept. 18 .....	" "
Grand Duchess 9th .....	April 14 .....	Imperial Oxford.
————— 13th .....	May 3 .....	" "
————— 18th .....	.....	.....
Grand Duchess 10th .....	Dec. 17 .....	Imperial Oxford.
————— 15th .....	May 6 .....	Grand Duke 10th.
————— 17th .....	.....	.....
Grand Duchess 11th .....	Dec. 27 .....	Imperial Oxford.
————— 12th .....	May 12 .....	Duke of Geneva.
————— 14th .....	.....	.....

## AMONGST THE IMPLEMENTS AT HEREFORD.

Hereford!—the very name is redolent of rich pastoral scenery; of green vales watered from woodland hills, and grazed by herds so comely with their ruddy coats, their spreading horns, and snowy faces; of orchards in bridal bloom, or gorgeous with their teeming load of fruit; and of hop-gardens, like English vineyards, green or golden

with their clustering vines. And Hereford, the antique city on the winding Wye, with its Norman minster and its older reminiscences of Ethelbert and Caractacus, has determined to reflect the beauty of its county—welcoming the great rural festival of the West with a picturesque enthusiasm of arches, banners, and floral glories, profuse

down each quaint street, and brilliant upon Tudor front and gable.

However, we have not to describe the glowing reception accorded to the Bath and West of England Society, but to chronicle some observations upon the metal and woodwork portion of the Show.

In the first place, the machinery in motion presents us with some thirty portable engines, in line, driving thrashing machines and mills. Here we have Hornsby's lately-improved thrashing-machine, Robey's portable engine, and Clayton and Shuttleworth's portable engine and thrashing-machine, with increased riddling surface, and a special arrangement for sifting the dust from the chaff, and then elevating the chaff, whether dry or damp, into bags or skips. A singularity is Brae's mill, constructed with a small conical burr stone rapidly revolving on a horizontal axis within a conical metal cover—a clever American contrivance known as Ross's patent. The Reading Ironworks Company show a thrashing-machine, simplified by driving the shock-board from the shaker crank shaft. Tuxford and Sons exhibit their straw-elevator, working with broad board-fingers instead of forks, by which means pulse as well as straw can be carried up the boat-shaped spout, while a chain above the straw prevents its being blown out in rough weather. Their new portable engine with horizontal cylinder has an improved slide-valve, by which the steam is so admitted and cut off as to work with a high rate of expansion, saving from 50 to 75 per cent. of the fuel and water ordinarily consumed, and of course greatly adding to the durability of the engine by relieving the fire-box of an excessive body of fire. Ashby and Jeffery, Turners, Ransomes and Sims, Brown and May, and Riches and Watts show an improved form of the famous American grist mill.

We have not space for detailing what is to be found in the immense collection of implements and machines, but may note a few things which arrested our attention. Thus, the Beverley Iron and Waggon Company have greatly improved the working and other parts of the three-horse reaper. Messrs. Howard have a very large stand of ploughs and other implements, among which we specially note the flexible chain-harrow, and the horse-rake improved in construction. Bentall has a fine show of chaffcutters and pulpers. Musgrave Brothers give us an extensive range of stalls and boxes for horses and cattle, with all sorts of fittings for feeding house and stable. Clay shows his cultivators; Bradford an improved churn, modelled after the washing machine; and Avery shows a new American churn (by Jebb), with tubes for admitting air and holding hot water. Badger shows sets of harrows, keyed without nut or screw; and on an adjoining stand people gather round the simple and speedy little ice-machines of Brown Brothers. Amies and Barford exhibit their water-ballasted rollers, Hancock's their celebrated butter machine, and Griffiths has a novelty in the shape of a self-acting carriage brake.

The trial-fields lay most conveniently close to the show-ground; old lea, vetch-stubble, swedes, green rye in the ear, and plenty of meadow-grass being provided for the various machines. There being no prizes, no competitive testing was wanted; and crowds of visitors expressed their own opinions upon what they saw, without judges to lead or mislead their judgment. Hunt and Pickering, Ball, Eddy, Howard, and Ransome, ploughed with their different implements. Eddy worked a turnwrest with short mould-boards, after the manner of Lowcock's plough, but without the oscillating double-breast. Ransome's man, Powell, did a piece of splendid work on Tuesday, and Howard's man, Brown, also showed the public how to cut and lay clean furrow-slices. On Wednesday Howards exhibited the action of their new "digging breast"—a short mould-board terminating in round prongs, which broke up the ground in fine style for fallowing.

Kell, Hunt and Pickering, and Coleman and Morton showed their cultivators on the same day; the latter paring with perfect uniformity of depth, and making beautiful work. Carson and Toone worked their horse-hoe in a piece of forward and very foul swedes in ridges.

The grass-mowers made an attractive exhibition; the machines being those of Wood, Hornsby, Picksley and Sims, Samuelson, and Bamlett. Picksley and Sims, and Wood, made specially good work. Burgess and Key are not exhibiting at Hereford. The grass was afterwards tedded by the haymakers—Howard's and Nicholson's; the former's improved machine giving great satisfaction by the efficient manner in which it separated, tossed, and turned the crop.

A piece of green rye in ear, 5 to 6 feet high, and in some places higher than that, but all upstanding, formed the testing crop for the reapers. The hand-delivery machines were those of Picksley and Sims, Wood, Burrows, Samuelson, Hornsby, and Barber. The first five had the now well-known tipping-platform; Samuelson's being distinguished for an attempted simplification in the mechanism—the main wheel driving the crank-shaft without any intermediate motion. Barber's machine has a reel, which is raised or lowered along with the cutter-bar; and by a lever movement the tightness of the endless driving-band is at the same time adjusted to the altered position. The driver has one seat, and the raker-off another seat close beside the other, and the corn is delivered in sheaf at the side.

The only self-delivery machines that we saw in the field were Hornsby's swathing reaper, and also the new machine just brought out by this firm; it being generally understood that green rye is a severe test for self-delivery apparatus, although the present was not a bulky or tangled crop. The new reaper, the novelty of the season, is a combination of the tipping slat-platform with the endless-chain delivery platform. The workman divides and picks up the crop with his rake, and tips the platform with his foot, as usual, but he does not touch the platform with his rake; in fact he has nothing to do but keep a sharp look out a-head, and directly he lifts his foot the cut corn is instantly delivered behind him, a long way out of the next track of the horses. The bunches, as we saw them, were laid straight and even, with the stubble-ends perfectly square across, ready for immediate binding, without any alteration of the shape or position. This is just what was wanted for certain localities where very heavy crops are grown, requiring the attention and skill of a harvestman on the box, and yet demanding more power for the side-delivery in sheaf than any man is able to exert.

Steam cultivation is well represented, as we have both Fowler's and Howard's sets of apparatus, with Aveling and Porter's traction engine, showing how steam ploughs and all heavy field machinery are to be hauled over farm roads, up and down hill, round short turns, and through narrow gateways. Fowler's 8-horse single-cylinder engine, with clip-drum, anchorage, and 3-furrow plough, did some 10-inch deep digging in a stiff loam at a very rapid rate. Howard's 3-furrow plough did its work extremely well, hauled by a 10-horse power engine and windlass, with double snatchblock and anchors. An interesting feature here was the working of Aveling's rope-porters, which travel with the rope before and after the implement; they are attached to and removed from the rope with the utmost ease and despatch.

On Tuesday some rare work was made with the steam cultivators, and we heard of good orders being given on the ground; as we have no doubt that the interest displayed by the great number of visitors from all parts of the district included in the society's rule, augurs favourably for the progress of steam tillage in the south-west quarter of the kingdom.



## THE HAMPTON COURT SALES OF BLOOD STOCK,

On Saturday, June 10th, by Messrs. Tattersall—

BROOD MARES AND FOALS, THE PROPERTY OF THE  
LATE MR. C. C. GREVILLE. Guineas.

Apricot (foaled in 1844), by Sir Hercules—Preserve, by Emilius (covered by St. Albans) (General Angerstein)	50
Muscovite's dam (foaled in 1841), by Camel—Lady Elizabeth, by Lottery (covered by Mentmore) (Mr. Sharpe)	11
Alkali (foaled in 1842), by Slane—Sea Kale, by Camel (covered by Battledore) (Mr. Watkins)	10
Torment (foaled in 1850), by Alarm, her dam by Glencoe—Alca, by Whalebone (covered by St. Albans) (Mr. Waring)	180
Lady Blanche (foaled in 1856), by Stockwell—Clementina, by Venison (covered by Orlando) (Colonel Maude)	360
Melody (foaled in 1846), by Bay Middleton—Octave, by Emilius (covered by Thunderbolt) (Mr. Starkey)	10
Eda (foaled in 1857), by Birdcatcher—Bridle, by The Saddler (covered by Oulston) (Mr. Blenkiron)	320
Eleanor (foaled in 1856), by Voltigeur—Thermis, by Touchstone (covered by St. Albans) (Mr. F. Martin)	210
Tecumseh (foaled in 1859), by Voltigeur—Helen Middleton (covered by St. Albans) (Marquis of Ailesbury)	280
Lady Caroline (foaled in 1861), by Orlando—Lady Blanche, by Stockwell (covered by Young Melbourne) (Lord Derby)	210
Railery (foaled in 1846), by Pantaloon—Banter, by Master Henry (with a colt foal by Dundee, and covered by St. Albans) (Mr. Waring)	80
Twitter (foaled in 1852), by Alarm—Little Finch, by Hornsea (with a filly foal by St. Albans, and covered by Mentmore) (Duke of Newcastle)	220
Vesuvienne (foaled in 1847), by Gladiator—Venus, by Sir Hercules—Melo, by Emilius (with a colt foal by St. Albans, and covered by Orlando) (Mr. Blenkiron)	420
Bay mare (foaled in 1861), by Voltigeur—Vesuvienne, by Gladiator (with a filly foal by Orlando, and covered again by him) (Mr. Tanner)	105
Gossamer (foaled in 1846), by Birdcatcher—East Steel, by Whisker (with a colt foal by Orlando, and covered again by him) (Mr. Blenkiron)	500
Barcelona (foaled in 1848), by Don John—Industry, by Priam (with a colt foal by St. Albans, and covered again by him) (Mr. Chaplin)	700
Durindana (foaled in 1851), by Orlando—Despatch, by Defence (with a filly foal by St. Albans, and covered again by him) (Mr. Rickerby)	175
Marquette (foaled in 1856), by Stockwell—Miss Twickenham, by Rookingham (with a filly foal by Newcastle, or Muscovite, and covered by Oulston) (Mr. Vaughan)	360
Little Queen (foaled in 1858), by Orlando, or Kingston—Palmyra, by Sultan (with a colt foal by Muscovite, and covered by Tom Bowline) (Lord Grosvenor)	960
Contadina (foaled in 1857), by Newminster—Mathilde, by Mango—Zafra, by Partisan (with a filly foal by St. Albans, and covered again by him) (Marquis of Hastings)	1500
Elzabeth (foaled in 1850), by Irish Birdcatcher—Blue Bonnet, by Touchstone—Maid of Melrose, by Brutandorf (with a colt foal by St. Albans, and covered by him again) (Mr. Blenkiron)	650
Catawba (foaled in 1857), by Cowi—Miami, by Venison (with a filly foal by North Lincoln, and covered by St. Albans) (Colonel Maude)	400
Jerusalem (foaled in 1856), by Jericho—Selina, by Orlando (with a colt foal by St. Albans, and covered again by him) (Mr. F. Martin)	500
Victrix (foaled in 1859), by Voltigeur—Eglantine, by The Flying Dutchman (with a filly foal by Orlando, and covered again by him) (Mr. Blenkiron)	580
Bouquet (foaled in 1855), by Bay Middleton—Violet, by Melbourne (with a colt foal by Orlando, and covered again by him) (Mr. Jackson)	800
Cantine (foaled in 1850), by Orlando—Vivandière, by Voltaire (with a colt foal by St. Albans, and covered by Young Melbourne) (Marquis of Ailesbury)	1800
Doralice (foaled in 1858), by Alarm or Orlando—Preserve, by Emilius (with a colt foal by Vedette, and covered by Voltigeur) (Colonel Maude)	1000
Total	11241

YEARLINGS BRED AT THE ROYAL PADDOCKS,  
HAMPTON COURT.

Bay colt (brother to The Knave), by Orlando out of Trickstrea, by Sleight of Hand (Mr. McDonough)	51
Bay colt, by Orlando out of The Deformed, by Burgundy or Harkaway out of Welfare, by Priam (Prince Soltykoff)	135
Brown colt, by St. Albans out of Garnish, by Faugh-a-Ballagh out of Gaiety, by Touchstone (Mr. W. Day)	260

Bay colt, by St. Albans out of Julia (sister to Attraction), by Orlando out of Nun Appleton, by Bay Middleton (Mr. Padwick)	550
Chestnut colt, by St. Albans out of Theodora, by Orlando out of Sultana, by Hetman Platoff (Mr. Pardoe)	800
Brown colt, by Y. Melbourne out of Aquamarina, by the Flying Dutchman out of The Gem, by Touchstone (Mr. Cameron)	130
Bay colt, by Wild Dayrell out of The Arrow, by Slane out of Southdown, by Defence (Mr. Joseph Dawson)	300
Bay colt, by Newminster out of Peri, by Birdcatcher out of Perdita, by Langar (Mr. Padwick)	900
Bay colt, by Newminster out of Braxey, by Moss Trooper out of Queen Mary (Mr. Chaplin)	1500
Bay filly, by Orlando out of Flight, by Jereed (Mr. Joseph Dawson)	100
Bay filly, by St. Albans out of Rosaline, by Orlando out of Switch, by Cain (Mr. Halford)	90
Brown filly, by St. Albans out of Bay Celia, by Orlando (Marquis of Hastings)	600
Bay filly, by Newminster out of El Dorado, by Harkaway (Mr. Jackson)	300
Bay filly, by Newminster out of Hepatica, by Voltigeur (Mr. R. I'Anson)	300
Bay filly, by St. Albans, out of Eulogy, by Euclid (Marquis of Hastings)	650
Brown filly, by St. Albans, out of sister to Little Lady, by Orlando (Mr. R. I'Anson)	300
Bay filly, by Orlando, out of Oasifrage, by Birdcatcher (Mr. C. Snawing)	300
Bay filly, by Orlando, out of Ayacanora, by Irish Birdcatcher (Mr. Padwick)	600
Bay filly, by Rastepain, out of Amazon, by Touchstone (Mr. W. Morris)	100
Brown filly, by Voltigeur, out of Distaffina, by Don John (Mr. Woolcott)	130
Bay filly, by Stockwell—Nina, by Cotherstone (Mr. Padwick)	330
Bay filly, by St. Albans, out of Nun Appleton, by Bay Middleton (Marquis of Hastings)	150
Bay filly, by Y. Melbourne, dam (foaled in 1855) sister to Bay Rosalind, by Orlando (Mr. R. Morris)	75
Brown filly, by Voltigeur, out of Lady Melbourns, by Melbourne (Duke of Newcastle)	180
Bay filly, by Newminster, out of Himalaya, by Bay Middleton (Mr. Cameron)	170
Total	8,571

## YEARLINGS, BRED BY THE LATE MR. C. C. GREVILLE.

Bay colt, by St. Albans out of Jerusalem, by Jericho (Marquis of Hastings)	450
Bay colt, by St. Albans—Eleanor, by Voltigeur (Mr. R. I'Anson)	310
Bay colt, by St. Albans out of Contadina, by Newminster (Marquis of Hastings)	1,500
Bay colt, by Orlando out of Lady Lianche, by Stockwell (Mr. R. I'Anson)	520
Bay colt, by Orlando—Gossamer, by Birdcatcher (Mr. W. Morris)	250
Chestnut colt, by Newminster out of Muscovite's dam, by Carmel (Lord Stamford)	410
Bay colt, by Weatherbit—Victrix, by Voltigeur (Mr. J. La Mert)	170
Bay colt, by Orlando—Bouquet, by Bay Middleton (Mr. Padwick)	330
Bay colt, by Orlando out of Railery, by Pantaloon (Mr. Jackson)	300
Bay colt, by Y. Melbourne out of Durindana, by Orlando (Mr. Cameron)	105
Bay colt, by Muscovite out of Melody, by Bay Middleton (Mr. G. Payne)	35
Bay colt, by Trumpeter out of Alkali, by Slane (Mr. H. Hill)	180
Bay filly, by Stampede—Little Finch, by Hornsea (Mr. R. Morris)	51
Black filly, by St. Albans out of Cantine, by Orlando, by Orlando (Marquis of Ailesbury)	270
Two bay fillies, by Orlando out of Torment, by Alarm (Mr. Starkey)	260
Bay filly, by Newminster out of Barcelona, by Don John (Marquis of Hastings)	950
Bay filly, by Y. Melbourne out of Doralice, by Alarm or Orlando (Mr. Jackson)	100
Bay filly, by Mentmore out of Twitter, by Alarm (Mr. Jackson)	65
Total	8,266



## DR. VOELCKER ON BARLEY AND MALT.

[The following letter has been addressed to the Secretary of the Central Anti-Malt-tax Association.]

SIR,—I beg to enclose the results of analysis of barley and malt:

The sample No. 1 I understand is raw barley, and samples No. 5, 7, and 9 are malted barley, called cattle malt, of the respective ages of five days, seven and nine days. No. 14 is brewers' pale malt, 14 days and 16 days old, having gone through the whole process of malting. No. 16 is brown brewers' malt.

The samples 5, 7, 9, 14, and 16, I am informed, are all made from the same barley.

You will observe that the barley not having been dried artificially contains about 3 per cent. more moisture than malt.

The greatest differences in the composition of barley and malt will be found in the amount of sugar which the several samples contain.

In the malt marked No. 5 the proportion of sugar is only about half a per cent. higher than in the barley from which it is produced.

In the next sample (No. 7) the sugar is perceptibly larger, and in No. 9 it amounts to nearly 8 per cent., whilst No. 14 contains about  $9\frac{1}{2}$ , and the brown brewers' malt nearly 10 per cent. of sugar.

The proportion of sugar, it thus appears, increases in the order in which the different samples are given in the enclosed tabular statement of results.

In the next place I beg to direct your attention to the column which gives the proportion of flesh-forming matter in barley and in malt.

You will notice that the sample of barley which you have sent to me for analysis, contains somewhat less flesh-forming matter than the sample of malt, which contains the smallest amount of these important constituents, and appreciably less than the sample of malt No. 9, containing the highest proportions of flesh-forming matters.

In the malt marked No. 9 you will notice there is about  $1\frac{1}{2}$  per cent. more flesh-forming matters than in the barley from which it is made.

It is interesting that No. 9 contains the highest proportion of flesh-forming matters, and that in the different samples of malt analyzed by me a gradual rise in these compounds may be noticed, which reaches its highest point in No. 9, after which the flesh-forming constituents again recede in the succeeding samples.

These differences may not be considered very great, still I cannot help thinking that they are sufficiently marked to warrant the conclusion that the feeding value of malt is likely to vary with the length of time during which the malting process has been carried on.

At all events, theoretically considered, the sample marked No. 9, being richest in flesh-forming matter, should be better than barley on the one hand, or the four remaining samples of malt on the other, so far as the nutritive value of different kinds of food is dependent on their relative proportion of flesh-forming matter.

As I have not carried out myself any practical feeding experiments with a view of testing the relative feeding properties of malt and barley, I am not in a position to corroborate or refute the theoretical opinion here expressed.

I may, however, be permitted to say, that, according to the testimony of trustworthy men, malt possesses the valuable property of rendering other food more digestible, and of preserving the health of fattening stock. In order to fatten animals as economically and profitably as possible, it is necessary to supply them liberally with a variety of food. The excess of

food conveyed into the system during the fattening period often greatly impairs the digestive powers of the animals, and endangers their health. Malt greatly assists the dissolving action of the stomach, and thus supplies the absorbing vessels readily with liquid food.

According to Payen and Persaz, the eminent French chemists, malt contains but 2-1,000ths of *diastase*, a compound which, not admitting of quantitative determination, is not mentioned in my analytical results. Notwithstanding this trifling quantity, the diastase of 1lb. of malted barley, according to Liebig, is capable of converting into sugar 5lbs. of starch. I believe, therefore, it will be found that the cellular fibre and husk of grain is more easily and thoroughly exhausted of starch when the crushed grain is mixed with a small proportion of malt, than otherwise. The full fattening effects of the grain will then be realized, and none of the starchy particles be carried off with the faeces.

We can thus understand why a small proportion of malt produces very striking effects when added to other less digestible food.

I am inclined to think that malt improves materially the feeding value of other less digestible food, not so much on account of the sugar it contains, as in virtue of the peculiar dissolving action which it exercises on other articles of food. Too large an amount of sugar in food, it appears to me, may probably have the effect of nauseating; and as brewers' malt contains much sugar, it is likely that, however beneficial in small doses, such malt ought not to be given to stock in large quantities. In conclusion, I would remark that it is very desirable to institute careful feeding experiments, with a view of ascertaining positively—

1. To what extent small doses of malt improve the feeding value of other food.

2. In what quantities malt should be added to the usual allowance of food in order to produce the most beneficial effect; and,

3. Whether or not large doses of malt have the effect of acting rather injuriously than beneficially.

The experience of feeders of stock appears to indicate that large doses of brewers' malt produce such an undesirable effect.

Believe me, sir, yours respectfully,

AUGUSTUS VOELCKER.

Composition of Barley and five samples of Malt, sent by Mr. A. Kintrea, for the Central Anti-Malt-Tax Association, 14, Warwick Street, Charing Cross.

	Barley, marked		Malt, marked		
	No. 1.	No. 5.	No. 7.	No. 9.	No. 14.
	No. 1.	No. 5.	No. 7.	No. 9.	No. 14.
	J.S.G.	J.S.G.	J.S.G.	J.S.G.	J.S.G.
Moisture	11.76	8.72	7.43	7.76	8.35
Sugar	3.75	4.29	5.48	7.85	9.46
Starch and dextrose	70.40	71.03	69.70	67.57	67.53
*Albuminous compounds (flesh-forming matters)	7.75	8.44	8.81	9.37	8.90
Woody fibre (cellular)	4.46	5.22	6.38	5.38	4.14
Mineral matter (ash)	1.88	2.30	2.20	2.07	1.92

100.00 100.00 100.00 100.00 100.00  
\*Containing nitrogen 1.24 1.35 1.41 1.50 1.38

AUGUSTUS VOELCKER.

11, Salisbury Square, Fleet Street, E.C.,  
May 18th, 1866.

## THE FRENCH SOCIETY OF AGRICULTURE.

A novel kind of exhibition is announced to take place in the Palais de l'Industrie, Paris, in August and September. The Central Society of Agriculture has conceived the idea of showing to the public a collection of, first, insects useful for their productions, such as silkworms of all kinds, bees, insects producing colouring matter; edible insects, and insects made use of in medicine; and, secondly, such as are injurious to various crops, as cereals, the vine, citrons, and other plants made use of in industry, to green crops and other edible plants, to fruit and forest trees, timber and wood; and, lastly, of parasitic insects of all kinds.

The edible insects will include the eggs of the hemiptera of Mexico, with the bread made from the same; the larvæ of India and China; locusts and Polynesian spiders. The Acclimatisation Society and the model farms maintained by the Imperial Government will furnish a considerable number of living specimens in some of the divisions; but there is little doubt that in others the public must be content with the "still life." The Minister of Agriculture and of Public Works has accepted the Presidency of the Committee of Organization, which includes several persons of scientific eminence. The Exhibition is announced to open on the 15th of August.

Trivial as this gathering may at first sight seem, it is by no means unimportant, and in its probable results may be even of greater benefit than competitive dog, cage-bird, pigeon, or rabbit shows. Let us see, for instance, how we are directly interested in these useful insects—the aggregate value to the world at large of these it is quite impossible to estimate. Of raw silk and silk manufactures we import annually about £17,000,000 in value; and with a moderate price there would be no limit to the demand for this esteemed fibre and its fabrics. Already the culture is being pushed into new channels, and several of our colonies are giving attention to it, especially in Australia and South Africa. Several very fine cases of silk from Victoria are shown at the Dublin Exhibition. There are dozens of other silk-producing moths besides the commonly named one, and many which, from feeding on oak leaves, castor-oil leaves, alanthus, and other plants, besides the mulberry, would be most valuable. Of the colour-yielding insects, cochineal, lac, kermes, &c., the product is nearly one million sterling; while galls and cantharides are other products of importance. Some 2,000 tons of honey are said to be obtained from bees in the United Kingdom; and we import foreign wax and honey of the value of £74,000.

But a knowledge of the injurious insects is of even greater importance to us than of the beneficial ones. How many of the staple crops are subject to predatory insects! The sugar-cane and coffee-tree, the cocoa-nut, the tobacco-plant, the grain crops; our gardens, orchards, fields, and forests—all suffer more or less from the attacks of insects; sometimes their ravages are most devastating. How many are the insects injurious to the cotton-plant! Some feed exclusively upon the leaf, some upon the flower, while others destroy the young buds and bolls or pods.

Some, again, are highly beneficial, as the larvæ of the ladybird, the ichneumon fly, and many others, that are ever on the search for living victims amongst the noxious tribes, and which serve to keep the numbers of the latter within proper bounds. Thus it is highly necessary to be able to recognize the injurious from the comparatively innocuous as well as the useful insects.

An investigation of the insects which serve for food is more curious than interesting in a country where flesh-meat is so much sought after; and those who care to look into the matter of locust-pie, ant's-egg bread, larvæ and grubs, fat ants and caterpillars, and beetles and spiders and such like delicacies, may consult a little work published a few years ago, "On the Curiosities of Food," by P. L. Simmonds (Bentley). This branch of the subject has, however, little interest for our readers. Those who can stay the pestilence of caterpillars, the grain aphid or wheat midge, check the ravages of the locust, the pests of ants and mosquitoes in foreign countries, or the attacking insects of particular crops, will do much service to mankind at large.

In the United States much more attention is given to entomological studies as affecting agriculture. It is some time since anything was done in this direction by the Royal Agricultural Society of England, while there is not a volume of the Transactions of the New York State Agricultural Society, or Report of the Commissioner of Agriculture, which does not contain one or more paper by D. Fitch, the entomologist, descriptive of insects injurious to agriculture.

It has been well remarked by a recent author, in a little work on "The Utilization of Minute Life," that the zoological works placed in the hands of students are necessarily so full of anatomical details, details of classification and observations upon the habits and instincts of animals, that very little space has (or could have) been afforded to notice the wonderful manner in which certain animals contribute directly to the welfare of mankind, and the methods by which they may be cultivated. This remark is especially applicable to the lower classes of animals—to the invertebrata. Their investigation, in a practical point of view, has led, and will still lead, to very profitable and interesting results. It has been rendered more interesting of late years by numerous experiments, having for their object the culture and artificial propagation of several of the more valuable species. It is important to ascertain by experiment whether any species already valuable in its natural state cannot be rendered more so—cannot be submitted to culture, and propagated more extensively by artificial means, and thereby increase the benefits we derive from it.

A rapid survey of the economy of nature is sufficient to convince us that we have numerous and vigorous auxiliaries always at hand to arrest the ever-threatening invasions of insects. It is our duty to aid their increase and employ their energies for the advancement of agriculture. We must begin, then, by abstaining from shooting useful birds, by favouring their reproduction, and by familiarizing them with our persons. Bird-netting is an abuse unfortunately too frequently indulged in; but it ought to be banished from the vicinity of cultivated lands, as bringing extremely detrimental to agriculture. Why slaughter our firmest allies? Why lift our hands against our benefactors and protectors? If woodmen and peasants could be made to understand the immense services most descriptions of birds render to mankind, they certainly would protect those valuable servants from the senseless destruction they are subjected to. When we come to consider the sort of animal food that birds make use of, we cannot deny that they tend to the preservation of the vegetable kingdom. A very large number of families of birds either feed exclusively or partially on beetles, caterpillars, larvæ, flies, spiders, worms, molluscs, &c. Birds are Nature's sol-

diers, and keep in subjection the inferior animals. If some amongst them constitute an excellent part of the food of man, furnish her with eggs, with useful feathers, or a good manure, all these services are scarcely worthy of notice when compared with their labours in the destruction of insects. For this especial duty the most essential of their organs have been adapted: their sight is piercing, and even the very smallest among them possess the most extraordinary powers of digestion, whilst their great activity and lightness enable them to exercise their calling incessantly and when most required.

The reproductive powers of birds and their instinct of migration are also due to this office imposed upon them. When, in the north, the insect world drops into its wintry repose, and sleeps under layers of deep snow, then most of the bird tribe fly to the south, there to perform the same duties; whilst those which remain all the year round in one place gather up the larvae, the eggs, the nests of insects, the few flies or spiders which may be tempted out of their holes by a sun-ray, and the coleoptera which gnaw the bark of trees.

## THE INTERNATIONAL AGRICULTURAL EXHIBITION AT COLOGNE.

Anyone looking into the show-ground some three or four days since would have said, and with some truth, that it would be a matter of impossibility to get the machines arranged and "in trim" by Friday, June 2nd—the opening day; for engines, thrashing machines, pumping engines, fire engines, huge cases, and packages innumerable, all seemed to be thrown together in "one lump;" but, with the assistance of a body of soldiers and workmen, things were got a little more in order. The English exhibitors were not behind, although yesterday some were not even unpacked; but one day appears sufficient for them to work wonders, for all were ready, "tant and trim," to receive the Crown Prince of Prussia this (Friday) afternoon at four p.m.

A portion of the grounds of the "Flora" are set apart for this exhibition. Those of your readers who have visited Cologne are no doubt acquainted with these grounds, which are situated nearly two miles away from the centre of the city. They are very tastefully laid out, and are at once the zoological and flower garden of Cologne; but the ground set apart for this exhibition is some three or four inches deep with dust and sand, and, with the least puff, visitors and exhibitors both are completely enveloped in a cloud of dust. It is said, "It is an ill wind that blows no one good." It is this proverb alone that can in any way comfort the exhibitors; for if during the exhibition a wind should spring up, it is not possible to remain on the grounds. The sheds are open, as at the Royal, and there is nothing to protect us from this "bugbear" here—the dust.

As at Stettin and Hamburg a number of merchants and bankers of Cologne met together, appointed a committee, judges, and stewards, and guaranteed all the expenses, although there is nothing to depend upon to meet the outlay but the admission fee, which it is thought will cover all, seeing the exhibition is open until July 2nd.

The Crown Prince of Prussia arrived at Cologne on Friday morning, and soon made his appearance on the grounds, and with one of the committee just took a preliminary and quiet view of the exhibition previous to his formally opening it at 4 p.m. As soon as the time drew near, the élite of Cologne drove up in a continuous stream of carriages, and by the time he arrived some thousands had congregated together at the entrance gates to give him a hearty reception. The English exhibitors were not behind. Here were engine-drivers, mechanics, and employers, numbering altogether some two hundred, mustered in one group, and Mr. Shuttleworth (of the firm of Clayton and Shuttleworth of Lincoln) giving the "cue," and when the Prince arrived this gentleman asked for "three British cheers," and cheers they were. The Prince in a moment knew the cheer, and with a smile (in fact he laughed quite) and a bow he acknowledged the reception given to him by the English.

No cattle or stock of any kind is exhibited—nothing but manufactures, products, and agricultural machinery.

The thrashing machines were tried yesterday. Every one appears, at present, satisfied with the fairness of these trials; but up to the present (Friday night) the result is not known, and will not be known before Monday or Tuesday it is said. This suspense increases the excitement already existing between the various competitors. All worked well; and it is quite guess-work if one attempts to prophesy as to the prize. The various competitors are Messrs. Clayton and Shuttleworth, of Lincoln; Hornsby, of Grantham; Ransomes and Sims, of Ipswich; Reading Iron Works Company; Messrs. Turners, of Ipswich; Robey, of Lincoln; and Garrett, of Leiston. A thrashing machine, belonging to the latter firm (through gross neglect in not testing the machine before lifting such a heavy weight from the barge), toppled over into the Rhine: the cast-iron drum, which receives the chain, was not firmly keyed on to the shaft; so when the weight of the machine was fairly on the crane, the drum slipped round on the shaft, and down went the machine into the Rhine, for the barge-man had the sense to move his barge away as soon as it had left the deck. It may be a loss to this firm, as they could not compete. On hauling it up, it was found to be not much broken, but the frame was strained; and in fact, to all intents and purposes, it was completely spoiled.

It was opened on Friday, June 2nd, with great brilliancy by the Crown Prince of Prussia; and every one who witnessed the sight of the opening ceremony congratulated themselves upon the fact that that was the commencement of what was to be a great and a successful undertaking. It is to be regretted it is far otherwise. There are many local subscribers who of course visit the exhibition every day; but beyond these, it has been said, that on Saturday, the first day the public were admitted, that only "three" paid at the entrance-gates (some have said there were "ten"); but take the whole of the seven days, and if you put down "a thousand" (which there certainly was not) altogether, as the total number that have paid to visit this exhibition since it has opened, your readers will have some idea of its success.

As was said before, there are no cattle exhibited; it is confined to products, industry, and machinery connected with agriculture.

The exhibitors and their assistants have been at a loss as to employing their time; but many have left, and many more on the point of leaving their stands to take care of themselves. Many urge it is the price that keeps visitors away; but one would think that 3s. would not be an object to those who prefer to go when the crowds are not present. But on Tuesday the committee were induced to alter the admission-fee to eightpence, but it appeared to make no sensible difference. It remains to be seen, when the fee is reduced to sixpence (which it will be on Monday), whether that will induce the public to visit "a really good and interesting exhibition."

Many blame the committee for keeping the exhibition open for a month, and assert that is the reason why the public come

in dribbles; others say, and with some truth, that it was folly to have an Agricultural Exhibition where cattle are not to be thought of: to have simply an exhibition of agricultural machinery, and no cattle exhibited. In England even, if such an exhibition took place, it would, I fear, cut a poor pligit.

It is not likely that landowners or the general public here will leave their homes and come a long distance to see such an exhibition; but if cattle had been exhibited as well, all would have had a general interest in it; in fact, the farmers would be exhibitors, and would attend as a matter of course with their wives and daughters. It is to be hoped, both for the committee (who will be great losers, if not) and the exhibitors, that the best is to come, and that all will be amply repaid—the latter for the time they have hitherto wasted, and the former for their great outlay.

The Crown Prince, on Saturday, with some of the committee, drove out some two miles, to the banks of the Rhine, to witness the performances of the steam fire engines. There were three of German manufacture, one American, and two of English manufacture (Shand and Mason, and Merewether's). The contest lay really between the two latter. The Prince was much pleased, and chatted and cracked jokes with the proprietors and their staffs, and very good-naturedly gave one a light to light his cigar. Another and final trial took place on Tuesday, and as formerly the contest lay between the two London houses. The Colonia Insurance Company (the Insurance Company of Cologne) offer 600 thalers (£75) for the best fire-engine; but the prizes have not yet been announced, and there are many conjectures as to which is to be the successful engine.

The Prince also visited the steam ploughing field, where Fowler's steam plough was at work. The tackle consisted of two engines, one at the top and the other at the bottom of the field, with a four-furrow balance plough, and is what is called "the direct system." The Prince was highly pleased, and put several questions to Mr. Fowler as to its capabilities and cost.

In a field close by, the mowing machines were set to work. There were several entered for trial: Samuelson's, Bamlett's, Brigham and Bickerton's, and two or three of German manufacture. Wood's American was asked for by several; but this machine, it appears, was not exhibited. A piece of grass was told off to each machine, and it soon became apparent that the prize must fall to Samuelson's. Its easy management and the manner it did its work pleased all; although Bamlett's was a good machine, and did its work well.

The haymakers followed. The entries were Boly's, of Bury St Edmund's; Nicholson's, of Newark; and Smith and Ashby's. Then came the horse-rakes, represented only by Nicholson's.

Mr. Fowler has had it all his own way as regards competing for the prize of £150 for the best steam plough, for none of the other makers of this class of machinery put in an appearance. Mr. Fowler fulfilled to the letter all the rules and regulations laid down by the committee; came up to the scratch when called upon, with his two engines, and balance plough with four breasts, and, with three men only, did the work allotted to him, without a single hitch of any kind, in prime style. In fact, to the bystanders, these machines appeared to be handled just like toys; and to many of the Germans, who scarcely have seen a portable engine, the steam plough appears to be an extinguisher; for when at work, they look at each other with amazement, to see the plough rip up clouds of earth as big as their body, and this without any noise or shouting. You hear no orders given: a simple wave of the hand or a whistle, and these three men appear to be quite at home, and understand each other; but while the exhibitor might be congratulating himself on riding over the course and claiming the prize, the jurors and committee objected to the prize being awarded, upon the grounds that there was no competition, therefore they could not make their award to "the best;" but on representing this view of the case to Mr. Fowler's representative, it was pointed out to them that there was nothing in their rules and regulations for them to fall back upon, to justify their withholding the prize. Then the committee said it was no trial; they were in communication with Garretts and Howards to send their tackle over, "and the real trial was to take place;" but again they were referred to their own rules—that "all machines that were not duly brought into the show-yard, and arranged by such a date, should not be allowed to compete for any prize."

The Direction, upon this view of the case, reconsidered the matter; and it is now generally understood that not only does Mr. Fowler deserve the prize, but that Mr. Oppenheim, the donor, will hand it over to him.

A prize of £75 was offered by the insurance societies of Cologne for the best road locomotive. The contest lay between Fowler's and one made by Schwartzkopf, of Berlin. It is generally understood that a majority of the jury is sufficient in deciding a prize; but it appears to be different here; for four out of the five jurors were for awarding the prize to Fowler; but the fifth, who happened to be an engineer from Berlin, stuck up for his townsman, and, from what has since crept out, would not be convinced, and nothing but a second trial would do, and which accordingly took place, when each engine had to run about the show-yard, go in and out of certain places, and make certain curves. At last a moist piece of ground was chosen in the yard for each engine to pass over. Mr. Fowler's representative, to the astonishment of all, volunteered to the judges to go over first, and "pave the way for his adversary." The engine accordingly passed over without the slightest signs of "sticking in the mud!" Not so the Berlin engine. The driver took particular pains to keep in Fowler's track, but before he had reached the middle the engine had buried itself up to the axles. A great concourse of exhibitors and visitors had assembled to witness the trial, and a great deal of excitement prevailed, and as soon as the Berlin engine had got into this fix, so soon did a number of the English cheer Fowler, and begin to chaff and to laugh at the other. It was feared at one time that a row would ensue, but the judges' advice prevailed, and they all separated, Mr. Fowler's representative volunteering with his engine to pull them out of their mess; this they of course declined, preferring to be pulling and tugging for eight long hours to get themselves out.

The attendance still is very small, in fact, if anything, rather less than last week; while the admission is now sixpence, and as this small entrance fee has failed to induce visitors from the surrounding districts to come to the exhibition, it must thus be looked upon as a complete failure, and the sooner the committee decide to close the agricultural part the better. The prizes are to be announced on Sunday afternoon at a festival. After this has taken place, the English exhibitors think of taking some decided step in a body, either to get permission to pack up and be off and return their machines, or if this is declined, they are in the mood for packing up and covering their machines and leave them to take care of themselves, for the longer the show is kept open the worse it must be for the committee, who will be great losers. They have incurred expenses to the amount of £11,000, and if they get £1000 in entrance fees they may consider themselves lucky, though their losses will be something considerable. The directors and committee have more than once expressed their sympathy with the foreign exhibitors who have been induced to bring their goods such a distance, and for no purpose, and they feel this more than their own loss; but it is now generally admitted that to have an agricultural exhibition "without cattle" is the real cause of its failure, and at the next exhibition cattle as well will be exhibited, as instead of a month the show will only be kept open a week.

Prince Alfred paid a flying visit to the agricultural department on Tuesday afternoon. He came in a very quiet way, as no one knew five minutes before that he was coming; and he rode up like any other man in a common cab, accompanied by a cavalry officer and another English gentleman. The exhibitors were not made aware at all of the Prince's presence; but one exhibitor, it appears, knew him, took off his hat, and addressed him in reply as "Your Royal Highness," hearing this the Prince smiled. He took great interest in the English agricultural machines, asking several sensible questions. He is studying at Bonn, some sixteen miles from here, and on leaving the yard promised to come again and have more time to look round.

It is now uncertain whether the prizes will be announced on Sunday, as the judges in some of the departments have not finished their awards; so perhaps the English exhibitors will yet have to wait another week before they get to know the awards of the jury.

The following are the exhibitors of English agricultural machinery:

Fowler, of Leeds, exhibits two traction engines, adapted for either road locomotives or as ploughing engines, also his patent balance plough.

Messrs. Clayton and Shuttleworth, of Lincoln—Two portable engines and thrashing machines.

Messrs. Ransomes and Sons, of Ipswich—A portable engine and thrashing machine, a patent grinding or crushing mill, and a patent corn screen.

The Reading Iron Works Company (Limited), late Barrett, Exall, and Andrews—A small portable engine and thrashing machine, chaffcutters, oilcake breakers, and crushing mills.

Messrs. E. and R. Turner, of Ipswich—A small portable engine and thrashing machine (the latter fitted with Boby's patent screen), crushing mills, oilcake breakers, &c.

Messrs. Samuelson and Co., of Banbury—Reaping machines, mowing machines, and turnip cutters.

Robey, of Lincoln—A portable engine and thrashing machine.

Messrs. Ruston and Proctor, of Lincoln—A portable engine and thrashing machine.

Hornaby and Sons, of Grantham—A portable engine and thrashing machine, ploughs, drills, and horsehoes.

Garrett and Sons, of Leiston Works, Saxmundham—A portable engine and thrashing machine, drills, and horsehoes.

Boby, Bury St. Edmunds—Patent selfcleaning corn screens and haymaking machines.

Bentall, of Heybridge, Maldon, Essex—A fine collection of chaffcutters, oilcake breakers, horseworks and horsepower thrashing machines, and pulpers.

Barnlett, late of Bedale, Yorkshire—Mowing machines.

Nicholson, of Newark—Haymakers, horsecakes, and oilcake breakers.

Messrs. Woods and Cocksedge, Stowmarket—Mills, pulpers, oilcake breakers, &c.

Messrs. Webb and Sons, Stowmarket—A collection of leather driving bands for driving machinery.

## MY VISIT TO THE BATH AND WEST OF ENGLAND.

BY A MIDLAND COUNTIES FARMER.

Few objects possess such true and varied interests to a genuine farmer as that presented by a good agricultural meeting. I was pleased to receive an invitation to take an official part at the meeting of this long-established institution, just at the precise season when farmers are debating in their own minds as to the probabilities of the ensuing harvest, and it is of moment to go abroad and view the land. The country through which I passed, in my journey to Hereford, includes every variety of soil: the alluvial deposits have good pastures and rather thin crops; wheat especially defective; the black fens are sadly deficient; well-managed clays are best in cropping, but bad in pasturage; light lands are only supporting light crops, and but little pasturage. My expectations for the coming harvest are greatly damped by what I have seen on my route, and I hesitate not to pronounce it to be a deficient one, but early. As I approach Hereford the country becomes exceedingly fine and beautiful; the Malvern Hills and district is supremely pretty and delightful; but beyond this, *i. e.*, from Ledbury to Hereford, it is extremely rich and beautiful, not surpassed by any I have yet seen; the only cause for regret being the denuded appearance of the innumerable fruit-trees. From the combined attacks of Jack Frost and large armies of caterpillars, nearly all the apples and pear trees are in their winter dress, looking, for the most part, as if actually dead: of course the product of cider and perry will be a very scant one. This dire affliction extends for very many miles in every direction; I saw traits of it in Warwickshire, more in Worcestershire, but worst in Herefordshire. The hop vines looked backward but healthy. As a farmer I grudge the land its heavy burthen of trees and hedgerows: as a tourist I admired the richness and beauty both of the trees and timber. I praised the breeding and grazing, but censured the farming. Four horses in length were drawing a plough on mild soil—yes, within a mile of Edith Weston itself. I wish Lady Emily could have seen it. I did not expect anything half so barbarous or so near the dark ages, within sight of the broad, rich, and beautiful estate and sunny park of one of the best and most devoted agricultural ladies of the kingdom. Hereford is a fine old city, possessing many real beauties in site and scenery. The Wye gives it a unique character. It abounds in fine historical interest; and from the profuse display of flags and ornamentation, its inhabitants manifest vast public spirit and a good deal of independence, as shown by their mottoes and devices; one struck me as singular, *i. e.*, "Church and Queen," on a tremendous flag from a public building; but no, I was in a cathedral city, so the church must predominate. Another was in Latin, very complimentary to modern agriculture. I thought during my attendance that in one point the Royal excelled the Bath and West of England, inasmuch that the former has a managing director of the whole; whereas the latter is divided into departments, of which each has a president. There was another point on which I differed. There are no prizes for implements or competitive machinery; nothing but a show of implements and agricultural machinery in the yard and a few trials in the field, the whole creating but comparatively little interest. I like to see the crowding around a prize implement or prize machine. The im-

plement is criticized, the judges are criticized, the merits of it are canvassed and compared with others. It obtains just the notice its award deserves, and its uses and value are thus brought out to prominent view; but without distinctive awards, all, for the most part, is but casually looked over, and unless the activity and pertinacity of exhibitors do not succeed in arresting attention, very little business is transacted. This was the general complaint: lack of business—dull affair! It was not so in the good old days of competitive trials. Most of our leading firms have to date their prosperity from their success in these early trials. The Royal takes these trials in quadrennial rotation; hence four years elapse between trial and trial. The Bath and West of England should occupy the interval, and not leave a deserving meritorious implement to slighted merit for that period. I am not much of "a dîner out," but I enjoy a good dinner, and that more especially when good and appropriate addresses are subsequently given by competent men. In this, the Bath and West of England excel—they have a good dinner. But, independently of this, "the dinner" brings together the best men of the time: one likes to see them, to know them, and, perchance, to gather something from them. It is a friendly gathering of kindred minds. In this The Royal is in fault. I care not for the viands or the wine. I want the union of interest, the concord of parties, the general gathering. I am sure it does good. Why, from the earliest date of The Royal's dinners I take great pleasure in the remembrance that there I heard a Daniel Webster, Robt. Peel, Bunsen, Adams, Palmerston, Carlisle, Ricasoli, Gladstone, Malakoff, and a host of others. We solitary farmers like occasionally to be brought into company with such men, and great numbers of us would rejoice if this banquet was again a fact. We, however, always expect some popular speaker, or our seats to a great extent are vacant. I should deem myself very intrusive to say much about the stock and implement show, after the report given by the *Mark Lane Express*: all I wish to say is, that it was a most interesting exhibition as a whole, and that the show of Herefords was never exceeded. I certainly never saw such perfect and uniform models of bovine beauty in the twenty-six yearling heifers presented. The interesting classes of bull, cow and offspring, obtained much favour. In the sheep classes were shown some very useful improved Ryelands—exceedingly well adapted, I thought, for moist climates or hilly pasturage. The improvement was divided by a cross from Lincoln longwools. The wool was thickly set, fine, and of tolerable length, and the animals of good form. This is one proof of the desirability of introducing more of the longwoolled sheep into the south-west of the kingdom. The high value of lustre wool forms a great inducement to breeding; but the humidity of the climate makes the experiment problematical. I should strongly advise the trial upon dry loamy soils, or on hilly slopes facing the north. The kind I would select should be the smaller breeds of Lincoln longwools, with wool of medium length and closely set. The best time for such selection is in the months of August and September, and this may be done at any of the Lincolnshire fairs. If on trial my views should be found to be correct, and I think they will, my visit and this paper will not be in vain.

## THE SEASON FOR SPARROW CLUBS.

BY HAWFINCH.

The little birds paired on St. Valentine's Day,  
And now they be breedun, and most on 'em lay,  
The cock birds some sits by the nestes and zings,  
Meanwhilst the hens settun' relaxes their wings.

But some, when their mates have'nt hatched their eggs well,  
The young uns has chipped their way o' the shell,  
Along wi' the faymale goes out arter food,  
Wherewi' for to nourish their squab caller brood.

Now, farmers, to sparrer clubs all who belong,  
Your time is to slaughter the creetur o' zong,  
For tisn't the sparrers alone you destroys,  
A prize on the heads on 'em zettun the boys.

But greenfinches, chaffinches, linnuts likewise,  
Yellowhammers, larks, buntuns, all ever as flies  
About them there fields where you strows pison'd grain;  
So set to and silence the zingunbirds' strain.

Atch pair as you kills you kills many moor by,  
In eggs as must addle, and young as must die,  
Bate bushes and brakes, my bucks; scour hills and dales,  
And try if you can't put your zalt on their tails.

What them little birds feeds their young on you knows,  
Worms, grubs, caterpillars, and creetur like those.  
In killun a sparrer or finch you're aware  
What thousands o' palmers and weevies you spare.

Ah, poor creepun things!—do encourage their breed;  
Do kill off the small birds upon 'em as feed.  
Them insects doan't none on 'em do you no harm;  
Now do 'em, poor creetur, hows'ever they swarm?

Birds med be kep under, to that I'll agree;  
The schoolboys sufficient for that purpos be,  
At Christmas about wi' bow-arrers and traps,  
Or birds-nestun now, let alone the young chaps.

Now goo to your Clubs and partake o' good cheer,  
And zum up the birds you've killed over your beer.  
And, if you can count 'em, to judge o' your gains,  
The billions o' varmint you've zaved by your pains.—*Punch*.

If *Mr. Punch*, or any other elegant critic on rural affairs, who depends on Cockney, Berlin and Parisian "naturalists" for facts, will walk into Lincoln's Inn Fields, he will there see three or four white-thorn, or "May" trees, that have been successively ripped of their leaves by caterpillars. If *Mr. Punch* will further use his brilliant and keen eye, he will observe a goodly number of feathered creatures, some basking in the dust, and others sitting in the trees, imitating sausage-frying under difficulties, and other sounds not more melodious. *Mr. Punch* may call these "creetur o' zong" if he please, as that is a question of judgment and taste, in which the public generally, and farmers particularly, are not interested. For *Mr. Punch's* information, however, we may say the short, restless birds there to be seen are the kind about which he has written *Joze*, viz., sparrows. A few minutes' observation and reflection will enable any one, if he be as acute and quick at reckoning things up as our Fleet Street friend generally is, to estimate the number habitating there at a good round thousand.

Now, these birds are voracious and given to gluttony, and had they been endowed with a natural appetite for caterpillars, they would have devoured three-fourths of these insects on the day they were hatched; and as they are given to doing battle one with another, a pitched set-to would have come off on the following morning as soon as it was day-light, over the quarter left the night before. If any sparrow in creation would have an appetite for bug food, and especially for caterpillar food, it is very certain a Lincoln's Inn sparrow would; for there green sward and open soil are scarce, and worms and other crawling creatures are few, while animal food of any kind is seldom comestable.

But mark, *Mr. Punch*, or any other critic, when you go, that the caterpillars have pursued their work of destruction

undisturbed—that is, undevoured by the sparrows—and so rapidly, that before they are half-grown they have stripped their tree of leaves, and are in danger of being starved to death. So instinctive too are they of this, that they are misusing the material which should have formed a covering, or cocoon, at the time of their transformation, and this by converting it into ropes for making their escape. During this skeddadling adventure they, the caterpillars, are as inviting to the appetite of the sparrows as were the pigs in the fable, which ran about in some hot country ready cooked, and a knife and fork stuck in their backs, "zinging"—according to *Mr. Punch's* notion of time and tune—"Come and eat, eat, eat me!" For on reaching the ground they caper across the paths and about the soil with a liveliness that makes one fancy the name the creature now goes by must originally—when folks spoke as they saw, and not as they heard—have been *caper*-pillars. In this position they would be highly interesting to "naturalists"; and even the sparrows—at least the cocks—seem to think there is fun in the fellows, if not food; for, as they pass on, they step up to them with native precociousness fully developed, and seem to say: "How are you, my capers!" whereupon they would be almost sure to give them a nip or a nibble, out of the pure love of mischief, but for nothing more. For if one may judge from observation, it may be concluded that a cock sparrow would no more think of taking one or a few to his "hen settun", or "for to nourish his squab caller brood", than *Mr. Punch* would think of handing his Judy a lemon for a dessert, or a cup of its juice to slake her thirst, because that estimable lady may take a slice medicinally with her calf's-head, or because she likes it in her favourite evening beverage.

*Mr. Punch*, in all probability, as we believe he can be careless, but cannot be stupid, has become during some hour of weakness forcibly impressed with the fine texts and superfine reasoning which have emanated from learned philosophers on the "balance of nature." But when our esteemed friend of No. 85 has been taking his rural walks abroad, or when he has been—like the school-master—abroad taking his rural walks, he may have seen a bird resembling the one which we have informed him is a sparrow, on the wing with a caterpillar in his mouth. From this, however, our friend must not, in his usually acute periods, which we believe are long and seldom broken, conclude that when sparrows can get caterpillars they prefer them to everything else; for this bird, especially the cock, is a genius in his way, like *Mr. Punch*; and it may happen that if his wife be "a-settun", he (the cock-sparrow) would conclude that the engagement came under the meaning of a sedentary occupation; and, therefore, that a little "alterative food", taken in time, may carry off what would otherwise produce, as doctoreses say, worse consequences; or, if the brood be hatched, the parents in this case may entertain the same view with regard to keeping the bowels of their young occasionally open, as do more highly gifted fathers and mothers when they resort to brimstone and treacle.

Again, *Mr. Punch* has no doubt further observed that his sagacious companion and watch dog (Toby), when accompanying him in his rural perambulations, frequently, and with every appearance of reliab, partook of a few blades of young corn or thrifty grass. Because Toby takes grass, for the relief, it may be, of his overcharged canine liver, will his generally experienced master conclude that if Toby could always get luxurious blades of grass or corn he would henceforth turn his nose up an extra half-inch every time he heard or saw a dog's-meat vendor, and thereby render it imperative on his master to warn these animal-food purveyors to shun No. 85, and for ever remember that his dogship had turned a rabid and fierce vegetarian!

If the "balance of nature," to which *Mr. Punch* has given the weight of his world-wide and otherwise distinguished and deserved support, can be proved, so far as caterpillars go, to depend on sparrows, the principle may be imitated in other directions; or what would be simpler and better, no principle of action need be observed, but the world may be allowed to wag, like Toby's tail, in its own way. As thistles are good for donkeys they should not be cut down; for to do this, and encourage wheat to grow that mankind may eat, is the way to knock Nature clean out of her equilibrium, by causing men to multiply and donkeys to die off. Wolves and wild boars, and many other similar brutes, were no doubt sent for good purposes; but one of these was not that they might be allowed to

run off, before the eyes of men, with the lambs, kids, and fruits of the earth, as these productions, if preserved according to civilized life, make excellent human food, whereby the nobler animals increase in the place of inferior brutes. The amiable and philosophic gentleman whom *Mr. Punch* has so befriended with his rhymes will probably in a week or two have a learned paper to read on the unwarrantable liberty the British Parliament is just taking with the "balance of nature," in passing the Act for diminishing the number of dogs which have run wild in Ireland, and last year worried some hundreds of thousands of sheep to death. It will be probably argued that as dogs kill rats and other vermin, it is better that a few hundred thousand domesticated sheep should be worried to death and eaten up, than that rats should have more freedom. Will *Mr. Punch* "set to song" this philosophy?

Weasels, and other members of the same interesting family, may be cultivated under the same views; but would *Mr. Punch*, in the interest of the "balance of nature," rejoice to see the baskets of game and samples of poultry which he habitually, and without sacrificing that high dignity which justly belongs to him, mentions about Christmas time in connection with his address—would *Mr. Punch* rejoice to see these packages from country admirers grow small by degrees and beautifully less? Many similar examples might be given, but with this we will conclude: If the "balance of nature" had been considered a part of the whole duty of man, and acted up to, the component parts of *Mr. Punch's* physique might have been in another animal form, which would now have been browsing on primitive thistles, willows, and rushes, in Moor Fields or Lambeth Marsh. But as mankind has done battle with his natural enemies, which include sparrows, through many generations, we have, as a felicitous specimen of the reward in store for men's care and industry, a hunch, in which so much wisdom lies, in Fleet-street, instead of the long ears, about the use and ornament of which men are still undecided.

What we say is, ducks, turkeys, and chickens will eat more "Worms, grubs, caterpillars, and creatures like those," than will sparrows. What we further say is, the large supply of poultry which the Lord Mayor of London had his attention drawn to last Christmas was owing in a great measure to farmers preferring to protect their grain and barley-meal, and feeding their wives' poultry to sparrow cultivation. Any way, if caterpillars be not exterminated till sparrows do it, they will long continue. In further proof of which, it may be mentioned that two sparrows' nests were built, and still remain in one of the trees above referred to; and the caterpillars not only ate the leaves clean up around them, but from the twigs that hang within reach of the hens "setton". In other London squares similar facts may now be found. And, therefore, what we again say is, we hope farmers will continue to admire poultry and bacon more than sparrows, and this, if for no better reason, that *Mr. Punch* may continue to have his exquisite palate frequently pleased with the choicest birds, and his corpus, particularly his hunch and brain, lubricated abundantly with the finest fat.

W. W. G.

June 6, 1865.

## MIDLAND COUNTIES ANTI-MALT-TAX ASSOCIATION.

A meeting of the Midland Counties Anti-Malt-tax Association was held at the Odd Fellows' Hall, Temple-street, Birmingham, on Thursday, June 15. The principal business of the meeting was to arrange a plan for united action during the coming election, in order that the farmers might facilitate the return of their friends to Parliament.

Mr. JOHN STONE, of Thornton Hall, Bingham, Notts, on being called to the chair, regretted that the views of the farmers with regard to the malt-tax had not been brought forward in the House of Commons in the manner they had a right to expect; he also much deprecated the manner in which the subject had been treated by the Chancellor of the Exchequer. The arguments of that gentleman had been weak in the extreme, and such in fact as ought not to have been submitted to the House of Commons. Those arguments had been answered over and over again, and there would therefore be no need for him to do so, especially if people took the trouble to read the

pamphlets and papers of the Association. The farmers (he thought) had not had due consideration paid to their claims; the question therefore was, "Are we to persevere in this agitation?" He wished every farmer in the country would answer in the affirmative. What they wanted was unanimity, and there would then be no difficulty in obtaining the repeal of the malt-tax. The farmers were not properly represented, but the time was coming when they should make every effort to obtain members who would pledge themselves to use their best endeavours to obtain the repeal of the tax.

Mr. MEIR, of Weeford, moved the following resolution: "That this meeting wishes to express its regret at the great want of sympathy shown both by the Chancellor of the Exchequer and the House of Commons generally to the just and temperate claims which the British farmer and the industrial classes have made for the repeal of the malt-tax, and the meeting unhesitatingly asserts that the so-called arguments used by the Chancellor of the Exchequer and others high in office against the repeal of the tax were not only weak, but one-sided and incorrect." Mr. Meir thought that at the coming election they should make it a *sine qua non* to support no man who would not support the repeal of the malt-tax. They must also do all they could to aid in getting in the votes for such men, that the pockets of the members might not suffer too much.

Mr. THOS. NEVILLE, in seconding the resolution, said it was one in which they must all agree. Never had a Chancellor of the Exchequer such an opportunity of dealing with the question. In the last session the tax might have been repealed without any new imposition, and he was sorry Mr. Gladstone should have preferred reducing the duty on tea, for which he was not asked, and the income-tax, to taking off the tax in question.

Alderman BALDWIN much regretted that when the 2d. was proposed to be taken off the income-tax, no member in the House of Commons had the courage to propose the reduction of the malt-tax instead. He was sorry he was obliged to think that those members who put themselves forward to be their leaders were not sincere, and he urged that at the coming election no member should be supported unless they were assured of his sincerity. They must also lay aside all party-spirit, and support the man who went in for the repeal of the malt-tax, whatever his politics.

The resolution was then put, and carried unanimously.

Mr. BARTLETT, from Northamptonshire moved, and Mr. H. SMITH seconded, the next resolution, which was to this effect: "That this meeting, feeling most deeply the importance of the present crisis for developing the views of the electors in the counties and boroughs of the Association, pledges itself to use every lawful endeavour to return to Parliament such men only as are in favour of the repeal of the malt-tax; and in order effectively to do this, recommends that local committees, communicating with the central committee of the Association, be formed in every electoral district, and that all possible information on the subject be afforded to the working-classes, by means of lectures and pamphlets."

Mr. CHAWNER said the arguments against the repeal of the malt-tax had never been properly met in the House of Commons; and he urged that when their suffrages should be demanded at the ensuing election, they would be given to no man who would not pledge himself for the repeal of the tax.

Mr. H. OSBORNE also thought it should be made a testing question at the election, and that they should be prepared to abnegate the special peculiarities of their political creed, in order to obtain the repeal of that obnoxious tax.

A vote of thanks was accorded to the chairman, and the proceedings terminated.

FLAX.—The imports of flax (dressed and undressed), and tow or codilla of flax, show a heavy decline this year. Thus, in the four months ending April 30, the total imports were 188,694 cwt., as compared with 447,928 cwt. in 1864, and 215,878 cwt. in 1863 (corresponding periods). The imports from Russia show a very great falling off, having sunk to 15,317 cwt. to April 30 this year, as compared with 108,463 cwt. in the first four months of 1864.

## CALENDAR OF AGRICULTURE.

Sow turnips, as directed last month, and finish by the third week. In the eastern counties, the late sowings in July escape the fly and mildew more than when sown in June. Drilled crops must be constantly scarified and hoed, and tall weeds subsequently pulled by hand.

The preparation of clay fallows must also proceed. The dung must be got ready, and the lime brought forward.

Draining of wet lands will be advantageously performed during this month. The turnip season being finished, the teams are employed in bringing forward stones and tiles; and the filling of the drains may go on rapidly, the digging having been previously done, except clearing their bottoms, which should be done immediately before they are filled.

Hay harvest will be mostly finished with this month. Carry all herbage as quickly as possible. Stack and thatch it without delay. Have in readiness abundance of thatch; and use during the carrying season tarpaulin cloths over the ricks, to screen from rain. A light cloth is useful, suspended from the ends of the ricks by pulleys, to defend against showers.

Continue folding the store sheep both on arable and grass lands. It is a cheap and effectual improvement in the inland situations of chalks, sands, and downs.

Vetches and clovers will now be abundant. Cut and carry the herbage fresh daily, for horses and cattle in the yards. Give the milch cows a foddering every night, in the shed and yard. Provide ample littering for sheds and yards: the quantity of dung made will repay, with profit, all expense and trouble.

The sheep flocks require attention. Protect, by dredging, against the maggot fly. Provide in the pasture fields small cots (moveable), to protect the animals from heats and rains.

Put mares to the stallion regularly. See that the cattle have water in the pasture fields. Repair fences; allow no gaps; and keep gates and wickets in the thorough order of use.

In early climates and seasons, the grain harvest will often commence in the end of this month, with peas, barley, and rye. The barns and rick-stands require repair, to receive the crop, which may soon be carried.

## CALENDAR OF GARDENING.

## KITCHEN GARDEN.

Transplant broccoli at different periods, for earlier and later spring supply, choosing, if possible, a moist state of soil; otherwise, if the weather be dry, every hole must be filled with water. The ground should be rich in nitrogenous manure; and therefore some soot mixed with spit dung will be useful, as it contains salts of ammonia. May-sown cauliflowers may be treated in the same manner. Endive is to be sown twice in the month. Sow early the last crop of scarlet runners and French beans, a row or two of *Cos* lettuce, radish (white and red turnip varieties), a sprinkling of carrots, onions, and salading, as may be required.

Celery is to be carefully earthed; and in doing this for the first and second times, hold each plant compactly with one hand, while the other applies fine earth close around the lower part of the leaves, but not so high as the growing heart. Give water copiously along the trenches, if the weather be dry; for the first good start is most important.

Sow a full crop of turnips (the Early Dutch White and Yellow), to come in late in the year and through winter.

After the second week, sow cabbage-seed for coleworts, called "greens"—one of the sweetest of spring vegetables. Transplant, dig, and manure richly a plot for a row or two; and try, with the dung, 2oz. of sulphate of ammonia to the small barrow. Very pure guano, to the extent of a pint

to the same bulk, would confer phosphates of ammonia and of lime, several ammoniacal and nitrogenous compounds, common salt, and neutral sulphate to the soil. It is the comprehensiveness of pure guano which stamps its value; and therefore we would always add it to the exhausted manure, as a restorative.

In planting leeks, make deep, case-like holes, and drop them in, applying water in a small stream, so as to fix the roots of each.

Transplant vegetable marrow and cucumber-plants already raised in heat. Dig a hole for each, in a warm, open spot of ground; put in a barrow or more of leafy, rich manure; and cover it with some light, rich soil. Plant, water, and cover with hand-glasses till growth be established, and then gradually train out the runners. Stop the points occasionally, to obtain laterals.

At all seasons, while crops are growing, stick peas, and top them, also broad and kidney beans. Earth up potatoes and legumens. Hoe and move among crops. Give to cabbage-plants weak guano-water. Train and peg down the regular, advancing shoots of vegetable marrows, gourds, and cucumbers.

## FRUIT DEPARTMENT.

At the end of the month, remove from fruit-trees all wild, ill-placed, and superfluous wood. Apple and pear-trees are deferred till next month.

## FLOWER GARDEN.

Take up bulbs, and dry them. Pipe and layer



pinks and carnations. Propagate geraniums, by cuttings, in sand and leaf-mould, plunging the pots into a gentle hot-bed. They soon rot, and may be transferred to larger pots, in a richer soil,

of loam, sand, and decayed cow-dung. Guano is reckoned a highly valuable stimulant; but when pure it may be dreaded, for flowering plants in particular; and if spurious, it is worse.

## AGRICULTURAL REPORTS.

### GENERAL AGRICULTURAL REPORT FOR JUNE.

The remarkably fine weather experienced during the whole of the month has had a most favourable influence upon the wheat crop. In all quarters it has progressed rapidly, in some districts passed the blooming period, and everywhere it promises a full average yield. The demand, therefore, for both red and white qualities has continued in a very inactive state: nevertheless, owing to the small supplies brought forward, the fluctuations in prices have been trifling. Most of our farmers seem determined to await the result of the new crop, rather than sell at present rates. They are certainly justified in doing so, as we can scarcely have wheat lower in price than it now is, even though the harvest may turn out very abundant. Hitherto, this year, we have imported very little produce from abroad, and it is scarcely to be presumed that the importations will materially increase with wheat at an average very little over 41s. per qr. The quantity of foreign wheat now in warehouse in the United Kingdom is estimated at 900,000 qrs., chiefly in middling condition. This quantity is held firmly by the importing houses, but the demand for it has been wholly devoid of animation. The supplies of wheat in stock, in this country, are still very large for the time of year, and of excellent quality. Even, therefore, if our present crop should turn out only an average, we shall not be in want of an adequate supply of wheat for some time. There has been an improved demand for barley, and the quotations have advanced 1s. per qr., owing to the unusually small quantities held in stock, and the moderate nature of the importations from abroad. Oats have sold briskly, at 1s. to 2s. per qr. more money; whilst both beans and peas have readily commanded extreme quotations. Flour has ruled the turn higher, with an improved demand.

Advices from most of the continental ports state that only a limited business has been passing in wheat. Prices, however, have been well supported. Barley and all other kinds of spring corn have changed hands somewhat freely, at extreme quotations. From New York we learn that both wheat and flour are much higher in price than in England, whether on the basis of gold or currency: we are not likely, whilst present rates continue, to receive any produce from that quarter; hence, for some period, our markets will be relieved of American supplies, which in the two previous years had a depressing influence upon price.

Large quantities of hay have been secured in the northern and southern counties, as well as in the neighbourhood of the metropolis, in excellent condition. The growth is a full average one; but the pastures stand greatly in need of rain. In some districts they are nearly bare of grass. Hay has been selling at good prices; meadow having produced £4 10s. to £5 15s., and clover £5 10s. to £6 10s. per load. New meadow has sold at from £3 to £4; whilst straw has ranged from £1 6s. to £1 14s. per load. Judging from the present appearance of the fields, it is doubtful whether the second cut of hay will exceed 1864. In that case, we shall have hay a dear commodity during the winter months.

Notwithstanding that very little rain has fallen, the potato crop is looking extremely well. The new potatoes on sale are wholly free from disease, and our impression is that the entire growth will be a very large one. Old potatoes are still coming freely to hand, and a considerable decline has, consequently, taken place in the quotations. They now range from 40s. to 110s. per ton. The imports of new potatoes from the continent have, as yet, been very moderate.

The advices respecting the appearance of the hop bine are favourable. Fly is to be met with in most plantations; but it has not interfered with the progress of the bine in any quarter. The demand for all kinds of hops

has, consequently, been very inactive; nevertheless, scarcely any change has taken place in the quotations. The best samples have been held at from 180s. to 200s. per cwt.

Notwithstanding that over 159,000 bales of colonial wool have been offered at public sale, the decline in prices has been confined to 9d. per lb. Great support has been given to the sales by the large purchases—60,000 bales—on account of continental houses. The great abundance and low range in the value of money are in favour of the wool trade; whilst the upward movement in the price of cotton is calculated to impart steadiness to the quotations. English wools have sold freely, at extreme rates.

The turnip and beet crops, though in want of moisture, are looking well, especially in the midland districts. Rain, however, is much required to bring them forward.

In Ireland the crops, almost generally, are looking splendid. Wheat, barley, oats, and potatoes promise a full average return. The corn trade, however, has been in a sluggish state, at previous quotations. The shipments of produce to England have been on a very moderate scale.

The Scotch markets have been very scantily supplied with most kinds of produce, for which the demand has ruled steady, at very full prices. The crops are looking extremely well, and harvest-work is expected to be commenced much earlier than in the general run of years.

### REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Owing to the increased supplies of fat stock on offer in the leading markets, and to the heavy importations from the continent, the cattle trade has been somewhat less active than in the previous month. Prices, however, have ruled very high, and good clearances have been mostly effected. The best Scots and crosses have found buyers at 5s. to 6s. 8d. per 8lbs. The Norfolk season is now just concluding, whilst that from Lincolnshire, Leicestershire, &c., has commenced. From these counties some remarkably good beasts have been received in the metropolis.

The supplies of sheep have steadily increased; nevertheless the mutton trade has been tolerably firm: at one time during the month the best Downs and half-breds realized 6s. 4d. per 8lbs., but that quotation was not realized towards the close. The general quality of the sheep has certainly shown some improvement.

There has been a moderate, but by no means active, inquiry for lambs at from 6s. to 7s. 8d. per 8lbs. The arrivals have been rather limited for the time of year.

Considering the heavy imports from abroad, the veal trade has been tolerably firm at from 4s. to 5s. 4d. per 8lbs. The foreign calves have mostly arrived in good saleable condition.

The inquiry for pigs has fallen off, and prices have fluctuated considerably.

The annexed return shows the total supplies of each kind of stock exhibited in the Great Metropolitan Cattle Market:

Beasts	...	24,050	head.
Cows	...	646	"
Sheep and lambs	...	165,720	"
Calves	...	4,278	"
Pigs	...	3,210	"

There were exhibited in the corresponding month in 1864, 25,890 beasts, 550 cows, 138,450 sheep and lambs, 2,789 calves, and 3,280 pigs.

We have noticed very little improvement in the quality of the foreign beasts at hand; but most of the German sheep have been fairly suited for butchers' purposes. The importations into London have been:

	Head.
Beasts .....	7,665
Sheep .....	39,586
Lambs .....	6,427
Calves .....	2,773
Pigs .....	5,444
Total .....	61,935
Same time in 1864 ...	39,029
" 1863 ...	30,056
" 1862 ...	29,841
" 1861 ...	32,751

The comparison of the arrivals of English, Scotch, and Irish beasts stands thus:—

From	June, 1863.	1864.	1865.
Norfolk, Suffolk, &c.,			
Essex and Cambridgeshire ...	13,700	10,800	8,400
Lincolnshire ...	470	600	2,000
Other parts of England ...	2,250	2,600	2,250
Scotland ...	690	2,905	2,315
Ireland ...	16	430	270

The prices realized during the month compare as follows with the two previous years:

#### COMPARISON OF PRICES.

	June, 1863.			June, 1864.			June, 1865.					
	s.	d.	s.	s.	d.	s.	s.	d.	s.	d.	s.	
Beef .....	3	4	to 5	3	4	to 5	0	3	6	to 5	2	
Mutton ...	3	8	to 5	3	6	to 5	2	4	4	to 6	4	
Lamb ...	5	4	to 6	6	0	to 7	0	6	0	to 7	8	
Veal .....	4	0	to 5	0	4	0	to 5	0	4	0	to 5	4
Pork .....	3	6	to 4	6	3	6	to 4	6	3	6	to 4	10

The scarcity of grass is complained of, in some counties, and this may, in a measure, account for the increased supplies of English stock brought forward during the month. Unless we have an abundance of rain ere long, increased numbers of beasts and sheep will be forced for sale.

Newgate and Leadenhall markets have been acattily supplied with meat, for which the demand has ruled inactive at fluctuating prices.

## AGRICULTURAL INTELLIGENCE, FAIRS, &c.

**ABINGDON FAIR.**—There was a good demand for all good animals at high figures, being from £1 to £2 per head dearer than at the fairs of 1864; good three-year-old steers made from £16 to £18 each, Welsh and Scotch ditto from £13 to £14, ditto smaller ditto from £10 to £12, fine well-shaped cows made from £20 to £24, ditto heifers £17 to £18, barren cows £16 to £17, weaned calves 25s. to 35s. each. Fat beasts made from £25 to £30 each, or from 10s. to 11s. 6d. per score pounds. Fat calves from £3 to £4. Best store tegs, hoggets, and ram lambs made from 40s. up to 60s. each, ewe ditto from 25s. to 35s., ditto fat wethers from 50s. to 60s. each, or from 8d. to 8½d. per lb. Fat Lambs 10d. to 11d. per lb. Horses from 30 to 45 guineas for large, and from 40 to 60 guineas for best nag and gig ditto.

**ALYTH JUNE MARKET.**—The best beef sold at 10s. 6d., and inferior at 9s. per Dutch stone. Mutton sold at from 6d. to 8d. per lb. Milch cows sold at from £11 10s. to £12 10s.; barrow cows, fat, from £14 to £17.

**BANNOCKBURN FAIR.**—Milch cows and Ayrshire grass beasts was a fairish show, and prices were quite equal to those current at Dumbarton and Rutherglen in the beginning of the present month. The demand for these two classes of stock, though it never reached anything like activity, was steady throughout, and a fair clearance was effected. There was an unusually large show of Irish calves, the dealers in which reported a fair trade at profitable prices. Highland stock was in little request, but no change in value took place. Fat cattle were stiff to sell, owing to the high prices asked; the best fetched fully 10s. per Dutch stone. The show of horses was large and varied, and a considerable amount of business was done. Good animals met a fair sale. Mr. John Forster, Carlisle, bought horses and ponies at from £10 to £35. Mr. Christie, Stirling, sold draught horses at from £10 to £35, and ponies at £5 to £15. Mr. Miller, Linlithgow, sold draught horses at from £15 to £35. Mr. Walker, Stirling, sold harness horses at from £20 upwards.

**BOROUGHBRIDGE FAIR.**—There was only an inferior supply of horses of all descriptions, though buyers were tolerably strong in numbers. Of hunters and the higher class of horses there were few shown, and they had bad sale. In riding and driving horses there was a better show, prices ranging from £20 to £60. In agricultural horses there was a scarcity, in consequence, no doubt, of the general prevalence of farming operations.

**BOUGHTON GREEN (NORTHAMPTONSHIRE) FAIR.**—There was a fine show of well-bred horses brought for sale, and the full attendance of dealers created high competition for first-class horses, and those adaptable for double harness for private carriages, &c., commanded figures varying from 55 to 70 guineas, and well-grown, strong young cattle for heavy draught, omnibus work, and other London purposes realized 35 to 45 guineas, cart-horses for road and team work 40 to 50 guineas, and ditto for farmers' work 15 to 25 guineas. Cart colts made 18 to 28 guineas. Well-bred riding horses sold for 20 to 40 guineas; neat cobs at 25 to 35 guineas; and horses of high blood, suitable for the hunting field, 60 to 110 guineas; horses of inferior stamp came at low prices. Fat stock is making extraordinarily high value, and the demand for store stock is very active, and graziers are paying fully 20 per cent. above the average of late years.

**BRAEMAR ANNUAL MARKET.**—The following are a few samples of prices: Mr. William Gruer, Braemar, sold a lot of one-year-old crosses at £7 per head; Mr. John Stuart, Invereg, two-year-old Highlanders at £10 per head, of very superior quality; Mr. Abercrombie, Coldrach, Braemar, sold a lot of two-year-old Highland greys at £8 6s. Old cows realized from £5 to £7 10s.; and calves, which were in briak demand, at from £2 10s. to £4 per head.

**BRAMPTON HILL FAIR.**—There was a great falling off in the quantity of stock as compared with last and other preceding years. There was but a thin show of Irish cattle, as also Highland bullocks; but for the latter and Galloways there was a good demand, the only drawback being the extravagant prices demanded by holders, the best prices being those obtained during each evening preceding the fair. County cattle in tolerable condition sold at high prices. The demand in general was fully equal to the quantity exhibited.

**CHRISTCHURCH FAIR.**—There was a much larger number of horses than usual present, but little trade was done. Cows were at a premium, but pigs were plenteous, and fetched high prices.

**DONCASTER FORTNIGHTLY MARKET.**—We had a good show of fat stock, the supply being larger than that of this day fortnight. This may be attributed to the high prices which farmers and graziers are now commanding for fat stock. Butchers complain loudly, but if all be true, both butchers and consumers will yet have more reason for complaining than they have at present. A cheerful market caused trade to pass off briskly at the following quotations: Beef 9s. 6d. per stone, mutton 8d. per lb., inferior do. 7d. to 7½d.

**DROITWICH FAIR.**—There was an average quantity of stock on show, and beef and mutton sold well, viz., at 7d. to 8d. per lb. Lambs in slow request, and many were driven home unsold. Mutton 8d. to 9d., and lamb 10d. per lb. Pigs scarce, and little business done.

**HAYLE FAIR.**—There was a full supply of stock, which exchanged hands at good prices.

**HORNCASTLE FAIR.**—This generally small fair was held on Thursday, and was rather better supplied with horses. First-class young animals, suitable for hack and carriage-work, were sold, as usual, before the fair began, at good prices. Young animals for agricultural purposes were scarce, but there were plenty of buyers. In inferior animals very little business was done. Of fat beasts there was a small show; trade brisk.

**LEDBURY FAIR.**—The supply of all kind of stock was scarce. Beef sold well at from 7½d. to 8d., with a tendency to rise in price shortly if the present intensely hot weather continues. Sheep do not sell so briskly; price 8d. to 8½d. Pigs sold well. Horses few, and trade dull.

**LEIGHTON BUZZARD FAIR.**—Best large cattle for grass keep £15 to £17 each, small black ditto from £10 to £12, barren cows from £14 to £16 each. Cows in calf and full milk from £20 to £24 each, heifers from £16 to £18, weaned calves from 20s. to 40s. Fat beasts from 10s. 6d. to 11s. per score pounds, ditto calves from 4s. 8d. to 6s. per 8lbs. Sheep: A good quantity of half-bred Leicesters and Down

were soon disposed of, lean tegs at from 35s. to 40s. each, ditto ewes from 40s. to 50s., weaned lambs from 25s. to 30s., ram ditto from 50s. to 60s., fat wether sheep from 5s. 8d. to 6s. per 8lbs., ditto ewes from 5s. to 5s. 4d., ditto lambs from 7s. to 7s. 6d. Pigs from 15s. to 40s. each, fat ditto from 4s. to 4s. 8d. per 8lbs.

**LOCHGILPHEAD FAIR.**—The demand was brisk. Good Highland stirks of one year brought from £5 to £7, two-year-olds from £6 to £9, three-year-olds from £8 10s. to £11 11s. Good farrow cows for grazing were in request, realizing from £8 to £12, according to quality. Ayrshire milch cows inquired for, and brought from £9 to £14.

**MORETON FAIR.**—There was a short supply of beef, which fetched from 6½d. to 7½d.; sheep, of which there was a good supply, 8d. to 9d.; calves 7½d.

**NORTHAMPTON FAIR.**—Trade good, prices still high. Large three-year-old store beasts made from £16 to £17 each, others from £12 to £14 do. Cows in full profit £20 to £24 each, smaller do. from £17 to £18, Shorthorn heifers £16 to £17, weaned calves 20s. to 35s. Fat beasts from 10s. 9d. to 11s. 6d. the score pounds. Store sheep were 1s. to 2s. each lower; fat do. keep their price. Store tegs sold at from 35s. to 40s. each, do. ewes from 42s. to 45s., do. lambs 20s. to 30s. Best fat wethers from 6s. to 6s. 4d. per 8lbs., do. ewes 5s. 4d. to 6s. 8d., do. lambs 7s. to 7s. 4d. Best four to six-years-old nag and gig horses made from 40 up to 60 guineas each, heavy agricultural do. from 30 to 40 guineas.

**OSWESTRY FORTNIGHTLY FAIR.**—The supply of stock generally, and of sheep and lambs, was very fair, and there was an observable decline in the extravagantly high prices that have ruled for the last few months, the butchers in this town demanding the somewhat extortionate price of 10d. per lb. for the best joints of beef, and a higher price still for mutton and lamb. Beef 7d. to 7½d., mutton and lamb 8d. to 8½d., pigs about the same as last fair, and veal 7d. per lb.

**PENZANCE FAIR.**—There were but few fat cattle. There was an average supply of lean cattle; but the business done was not large, at 45s. to 40s. per cwt. Young horses were few in number, and the prices varied from £6 to £12. A fine lot of cart-horses was shown for sale by an Illogan horse dealer, being of the Welsh breed, and were offered at prices ranging from £12 to £35 each.

**BOSLEY FAIR.**—There was the smallest supply of cattle that has been seen upon the hill at this fair for many years. Fat cattle sold at 8s. per stone. There were very few sheep. Hogs sold at 22s. to 32s., fat sheep 30s. to 45s. Horses of the second and third class were very numerous, but good animals were scarce.

**SALISBURY FORTNIGHTLY MARKET.**—The number of beasts, although comparatively short, was larger than at last market. There were many good and useful qualities among them, and previous prices were paid, but sales ruled slow for inferior descriptions, and a clearance was not made until late in the afternoon. In the sheep department the supplies are increasing, about 2,200 having been penned to-day. There was less activity than has been observable for some markets past, and the high prices which have been current for so long a period were not maintained. Oxen realized from 12s. to 13s. 6d. per score, and heifers from 11s. to 12s. 6d. Mutton out of the wool may be quoted at from 8d. to 9d. per lb.

**ST. COLUMB MONTHLY MARKET.**—There was a small supply of both fat bullocks and sheep. The former fetched from £3 3s. to £3 7s. per cwt., and sheep from 7d. to 7½d. per lb. Of other stock there was a small supply, and on the whole it was not a brisk market.

**STAMFORD FAIR.**—There were only a few store beasts, principally young ones; but owing, it is said, to the scarcity of keeping, a bad trade was done, there being a great difficulty to turn them into money. Three pens of fat sheep, for which the farmers asked as much as 11d. per lb., were left on hand, it being thought by some intending buyers that 8d. was a fair price.

**STRANRAER MONTHLY MARKET.**—From the commencement the demand was brisk, and several lots soon changed hands at high rates. The black two-year-olds were selling from £12 down to £8 per head; stirks of the same breed brought from £8 10s. down to £3 10s. each, while the Ayrshire stock were going at various high prices, age and qua-

lity considered. Upon the whole the market was a quick selling one at high prices.

**TAUNTON FAIR.**—There was a fair attendance of farmers, but dealers did not make their appearance in any large numbers. Fat beef of prime quality realised 13s. per score, with a fair supply; half-fat beasts from 10s. 6d. to 11s. 6d.; prime steers maintained late prices, but poorer ones were dull of sale. There were but few barreners offering; the quality was anything but first-rate, and the business transacted was limited. Cows and calves fetched from £11 to £22; and, for the reason above stated, poor beasts were fully 30s. per head more than they were a month since. In the sheep fair the supply of fat mutton was good, with a fair sale at from 7d. to 8d. per lb. There was a good supply of lambs, at from 8½d. to 9d. per lb. Poor sheep was in fair supply, but trade was dull, and prices in favour of buyers. The horse fair was the largest we have seen for years, and some really good and useful animals were offered. First-rate hunters fetched an average of 60 gs. each; carriage horses, £25 to £40; hacks, £20 to £25; cart horses, £25 to £30; colts, four years old, £25 to £32; ponies, from £5 to £14 each.

**TEWKESBURY FAIR.**—There was a large attendance. Best heifer beef realised 8d. per lb.; second-class ditto, 6½d. to 7d. Best wether mutton fetched 9d.; ewes, 8d.; lambs, of which there was a fair supply, 10d. to 1s. All kinds of stock sold well.

**TIVERTON FAIR.**—The attendance was not so large as usual, but there was a good supply of all kinds of stock, especially of lambs, which was really extraordinary. Beef was firm at 12s. to 12s. 6d. per score; fat sheep, 7½d. to 8d.; lamb 9d. per lb. Cows and calves from £12 to £18. The demand for barreners and steers, and store sheep and lambs was very slow.

**IRISH FAIRS.**—**TURLOUGH:** The demand for calves was extraordinary. Young stock fetched high prices.—**BATH-KEALE** was well supplied; but, there was not a willingness on the part of buyers to purchase stock, although there was a numerous attendance. Beef rated high and was eagerly looked for; two-year-olds were in good demand, and brought so high as £13; yearlings were in brisk demand, and all of a good kind were well paid for; milch cows were scarce; any bought brought fair prices. The highest paid was £12. Good lambs brought as high as £1 10s. There was not much demand in general for mutton.—**ARDNAREE:** Strong heifers were in demand, and they sold well, while bullocks were in general passed over.—**RUAN:** Store cattle were in brisk demand, whilst fat stock maintained their usual high price. Three-year-old heifers from £12 to £14 10s.; two-year-olds sold at £10 10s. to £13, and one lot sold at £14. Yearlings produced from £6 to £10; springers and milch cows from £14 to £18. Beef might be estimated at 65s. per cwt., and mutton at 7d. per lb. Hoggets were quickly bought at 45s. to 56s. each, and lambs at from 20s. to 28s. each. The pig fair was not large. Bacon and Berwicks sold at about 52s. per cwt.

**SCOTCH FAIRS, &c.**—At Bannockburn Fair on Tuesday there was a large attendance of dealers and farmers from all parts of the country. The market, in respect of size, was considerably under its predecessors, but the quality of stock brought forward was a good average. Milch cows and Ayrshire grass beasts made a fair show, and prices were quite equal to those current at Dumbarton and Rutherglen at the commencement of the present month. The demand for these two classes of stock was steady, and a fair clearance was effected. There was an unusually large show of Irish calves, the dealers in which reported a fair trade, at profitable prices. Highland stock were in little request, but no change in value. Fat cattle were stiff to sell, owing to the high prices asked. The show of horses was large and varied, and a considerable amount of business was done.—Alythe June market was held on Tuesday on the market moor. There was fully an average show of superior fat cattle; while the display of lean, chiefly English and Irish beasts, was over that of former years. The market opened dull, and continued so until mid-day, when it became somewhat brisk, but towards the close it was more languid, and some fine old lots were sent away unsold.

**LIVE STOCK SALES, EDINBURGH.**—For best beef 9s., current 8s. 3d. to 8s. 6d., middling and inferior sorts from 6s. to 8s. Clipped sheep from 8d. to 8½d., ewes, &c. from 4½d. to 7½d., rough widders 9d. to 10d. The best class of bullocks

and heifers sold from £22 up to £27 per head. A great number of both bullocks and heifers sold from £16 up to £22, and a number of smaller sorts sold from £10 up to £14. The best class of cows sold from £18 up to £22 15s., and a number of middling sorts sold from £9 up to £16 per head. One kind of half-bred hoggs sold in lots from 44s. 9d. up to 50s. 6d., another kind from 45s. 3d. to 40s., another kind from 44s. up to 47s. 9d., and a number of other lots of smaller sheep sold from 30s. up to 38s. per head. Several lots of rough sheep, sold from 45s. up to 56s. per head. Ewes, &c., from 24s. up to 50s. Pigs sold from 50s. to 70s., and fat calves from 55s. up to £4 14s. per head. A great number of lambs sold from 2s. up to 36s. per head, and down to 17s.

## WOOL MARKETS.

### ENGLISH WOOL MARKETS.

CITY, MONDAY, June 26.—Since our last report there has been an improved demand for most kinds of English Wool for home use, and the inquiry on continental account has ruled steady, at very full prices. The supply of Wool on offer is only moderate.

CURRENT PRICES OF ENGLISH WOOL.		s.	d.	s.	d.
Fleeces—Southdown hoggets.....	per lb.	1	8½	1	10
Half-bred ditto .....		1	11	2	0½
Kent fleeces.....		1	11	2	0½
Southdown ewes and wethers ..		1	8	1	9
Leicester ditto .....		1	10	1	10½
Sorts—Clothing .....		1	6	1	11
Combing .....		1	6	2	0

BRACKLEY WOOL FAIR was well attended, and a large quantity of wool was sold—in all 10,580 fleeces. The average price was 59s., the highest being 60s. Mr. Bartlett, of Whitefield, as on former occasions, was the largest seller, and took the cup for it. He sent 2,101 fleeces. The largest buyer was Mr. Vickers, of Leicester, who bought 650 tods; Mr. Nosaiter, of Birmingham, who on previous fairs had been chief buyer, purchased 270 tods.

CUMBERLAND WOOL MARKET. — At Penrith on Tuesday, wool ranged from 1s. 10d. to 2s. 3½d. per lb.; at Brampton, on Wednesday, there was a slow, dull sale, at the following quotations: Half-bred hoggs 2s. 2½d. to 2s. 3d. per lb.; mules, 1s. 10d. to 1s. 11d.; Cheviots, 2s. to 2s. 1d.; half-bred ewes, 1s. 11d. to 2s. At Longtown, on Thursday, Cheviots, 2s., cross-breds 2s. to 2s. 1d., half-breds 2s. 2d. to 2s. 3d., and one lot 2s. 4d.

DONCASTER WOOL MARKET, (Saturday last.)—There was an immense supply of wool, nearly 1,500 sheets. Advanced prices were generally demanded, as farmers have been obtaining more during the week, but it was not freely given. There was a good clearance made at the close, at rather over the prices of last week. All-ewes 27s. to 28s. 6d., mixed hogg and ewe 29s. 6d. to 32s., all-hoggs 32s. 6d. to 33s., locks 17s. to 18s. per 14½lbs.

EPSOM WOOL FAIR.—The downward tendency which the prices of wool manifested during the spring has been fairly checked, and the expectation that the growers of English wool would not be able to secure such remunerative figures as they have done of late years appears not to have been formed on sound grounds. Between 16,000 and 18,000 fleeces of fine half-bred and down wool were exhibited. On Wednesday business from its commencement was very brisk, and nearly, if not the whole, was cleared off at prices ranging from 1s. 8d. to 1s. 10d. for Down ewes, and from 1s. 10d. to 2s. and even 2s. 2d. for half-bred tegs. It was the briskest fair that has been held here for years. The lot which fetched the last-named price was 470 half-bred fleeces belonging to Mr. Charles Coombe, of Cobham Park. Mr. Coombe's half-bred wool fetched 2s. 3½d.

HAWICK WOOL FAIR.—Prices both for half-bred and Cheviot wools show considerable improvement on last Edinburgh sales, the former being considered 4s. to 5s. per stone, and the latter about 4s. per stone higher. Half-bred hoggs 44s. to 54s. 6d., half-bred wether 45s. to 48s. 6d., Cheviot mixed hogg and wether, 36s. 6d. to 47s., black-faced 22s. 6d. to 26s.

LEICESTER WOOL TRADE.—A good business has been done this week, although there is decidedly less excitement,

many buyers having supplied themselves and retired from the market. Holders are very firm, but prices show no improvement on last week. Wool is difficult to buy in the country; quotations keeping in advance of the actual market value. Half-hogg lots make from 58s. to 60s. Several fairs take place next week, which will, no doubt, have their effect upon the market.

STONY STRATFORD WOOL FAIR.—10,000 fleeces were pitched, nearly all of which were sold. The highest price given was 62s. per tod, the lowest 59s.: average, 60s. 6d.

YORK WOOL MARKET, June 22.—We had upwards of 1,000 sheets of wool, about 100 of which remained on hand. Owing to the high prices required, business was very dull, many people from a distance not purchasing at all. For the higher qualities of wool an improved price was obtained over our previous week's quotations; other sorts may be stated at last market's rates. For Leicester, Lincoln, and other prime-bred wools the highest price reported was 32s. 6d., and the lowest about 24s. 6d. per stone, as per quality and count. Moor wools are now in the market, and sold at 13s. to 14s. per stone, and locks and cots 16s. to 17s., and even 20s., as per quality and count.

### LIVERPOOL WOOL MARKET.—June 24.

SCOTCH.—There is nothing new to report this week; in the face of the new clip the demand continues limited, at prices rather in favour of buyers.

	s.	d.	s.	d.
Laid Highland Wool per 24lbs.....	18	0	19	0
White Highland do. ....	22	0	26	0
Laid Cheviot do. unwashed	24	0	28	0
do. washed ...	28	0	32	0
White Cheviot do. washed ...	44	0	50	0

FOREIGN.—There has been a fair demand for useful long-stapled wools, which were light in stock, and were the selection better it would lead to a larger business.

DUBLIN WOOL MARKET, (Friday last.)—There was a large quantity of wool, and trade was slow, holders standing out for more money than buyers were inclined to give, the rates demanded being 2s. for wether and 2s. 1d. for hogg. Long-wools have the preference.

BONES.—The imports of bones in the four months ending April 30, this year, amounted to 11,049 tons, as compared with 19,080 tons in 1864, and 23,352 tons in 1863 (corresponding periods). The imports of bones (except whalefins) amounted, in 1850, to 27,198 tons; in 1851, to 31,956 tons; in 1852, to 48,884 tons; in 1853, to 37,785 tons; in 1854, to 56,422 tons; in 1855, to 65,055 tons; in 1856, to 70,949 tons; in 1857, to 63,951 tons; in 1858, to 85,293 tons; in 1859, to 84,280 tons; in 1860, to 62,321 tons; in 1861, to 66,509 tons; in 1862, to 67,230 tons; in 1863, to 77,494 tons; and in 1864, to 68,869 tons. As regards the value of the bones imported, we have not last year's figures at hand, but we find that the total for 1854 was £296,215; for 1855, £409,849; for 1856, £363,613; for 1857, £396,496; for 1858, £466,700; for 1859, £421,207; for 1860, £306,765; for 1861, £332,207; for 1862, £369,001; and for 1863, £431,779. Justin Von Liebig was extremely indignant recently at England for consuming so vast a quantity of bones, calling her the Agricultural Vampire of Europe! Truly, there seems some little justification for the complaint of the illustrious *savant*.

## POTATO MARKETS.

### BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, June 26.—For the time of year large supplies of old potatoes are on sale. Good and prime qualities are in fair demand, and prices rule firm; but inferior samples are a dull inquiry. The quotations range from 60s. to 120s. per ton. New potatoes are in moderate supply, and the demand for them rules steady. Jersey descriptions are selling at 6s. to 10s., and foreign do. at 6s. to 8s. per cwt. Last week's import was 210 baskets from Boulogne, 457 boxes from Marseilles, 117 baskets Dunkirk, 45 baskets Caen, 3,280 baskets Rotterdam, 123 boxes Lisbon, and 48 tons from Jersey.

## REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The month of June, though it has brought us nearer to the harvest, has not been genial enough to bring much promise with its sunshine. It indeed opened with abundant rains, and but for these we should have had drought in an alarming degree. It has almost universally been a sunny time, though there have been cloudy days, and the nights have often been piercingly cold and occasionally frosty. The hay has been well got, but is not abundant. Oats have received a sad check to their growth, and everywhere look stunted and unpromising. Barley varies much, some pieces looking well, and others perfectly miserable, and hastening on to immature ripeness. Beans are short in straw, with but few pods; and it is the same with peas, only with more variety. The thin wheat on the light lands can yield but little; though on the deep loams, where the drought has been scarcely felt, we may not only have a fair crop, but also a fine quality. As a whole we cannot make a favourable comparison with past years, and our general gatherings scarcely point to an average. Rain may yet fall, and fill the ears and pods more than might be expected; but the growth of the plants is pretty well finished. Nor are foreign accounts very flourishing. The linseed and rye on the continent are universally bad, cereals generally doubtful; while in Russia the pressure of drought has been exceedingly severe, and should we need extensive imports, we have not the satisfaction to be able to say where they are to come from. The first flush of fine weather produced its usual effects. The brilliant sunshine made anxious sellers and cautious buyers, with markets anything but gay; but in process of time the scene changed, and the last two Mondays placed 2s. additional value on wheat; while oats, as first and most seriously affected by the drought, have in the course of the month gained 3s., half the advance being on the last market. The potatoes as yet have stood the weather well, and the quality of the early sorts have proved exceedingly good, but we doubt an average yield without a change; and as to turnips and other esculents, things at present look serious. Our opinions as to holding of wheat at late rates have hitherto been justified, and we look for a further improvement, more especially as the wants of the Southern States of America are now plain, and both Virginia and Georgia are in extremities, while the shipments from the lake ports to New York have considerably lessened. Accounts vary as to the crop on the ground, but a great produce is not expected. The following were the recent prices of wheat at the places named:—At Paris the range was 38s. 6d. to 43s.; at Antwerp red Baltio was worth 44s.; at Liege quotations were 44s. 6d.; at Amsterdam fine Polish 49s. per qr.; at Maestricht white Zealand 43s.; red wheat at Hambro' to 43s.; at Stettin to 37s.; mixed new at Dantzic 36s. to 43s. 6d. per qr.; red at Cologne 39s.; at Strau-

bing, in Bavaria, 35s.; Milwaukie, at Montreal, 36s. per 480 lbs.; Chicago 35s. 7d.; the best white Michigan, at New York, 50s. per 480 lbs.; Chicago spring red 36s. per qr. of 480 lbs.

The first Monday opened on the back of rather better English supplies than previously, with a fair arrival of foreign. The morning's show from Kent and Essex was very small; but it being Whit Monday, the market had much of a holiday character, though factors were not disposed to tempt business by lower offers. The same quietness obtained in the foreign trade, but the finest qualities of Dantzic not being plentiful were held at full prices. With small arrivals off the coast there was no alteration in the value of cargoes. Though the weather through the week was forcing, the country markets were generally so poorly supplied that no change generally was made, though a few places noted a reduction of 1s. per qr., as Bourn, Market Harborough and Melton Mowbray; but at Lynn, Newcastle-on-Tyne, Spalding, and Bristol, there was more firmness than in the previous week. Liverpool made no change, Edinburgh was dull, and Glasgow 3d. to 6d. per boll down. The tendency was also that way at Dublin and several places in Ireland.

The second Monday had a very small English supply, but a large increase in foreign arrivals. The trade still ruled dull, but prices were much the same as on the Monday previous for English samples. Notwithstanding the abundance of foreign, there was more disposition to do business, especially in useful Russian qualities and prime old Dantzic, at quite as much money. With arrivals still scanty off the coast, there was no change in the quotations of cargoes afloat. With a continuance of fine weather in the country, the markets generally were so steady that no change could be noted. Millers indeed hoped to do better in their purchases; but farmers appeared indisposed to make further concessions, not believing that the appearance of the crop on the ground promised either the abundance or the quality of previous years. In Scotland and Ireland the same sort of feeling appeared to prevail, with very little business passing.

The third market had a small English, but rather large foreign supply. The show of samples this morning from Kent and Essex was very limited; and some of the last country markets evincing more tone, in consequence of much of the wheat looking unfavourable, factors held for 1s. per qr. advance; which was occasionally paid, though business was lessened in consequence. Foreign wheat also found a more ready placement at some improvement on previous rates, even the low qualities bringing rather more money. In cargoes afloat little was doing, with prices unchanged. The country markets this week were either firm or rather better. Hull, Boston, Bristol, Lynn, Louth, Market Rasen, Spalding, Sheffield, were all severally 1s. per qr. higher,

with some other places, and Stockton-on-Tees was up 1s. to 2s. per qr. Liverpool throughout was firm. Edinburgh was 1s. per qr. dearer; but Glasgow was without change. The Irish markets were steady.

The fourth Monday opened on small supplies both English and foreign. The morning's show of samples from Essex and Kent was more limited than for some time past, and several markets in the country were rather dearer. Factors found a fair opportunity to raise prices 1s. per qr., with a steady sale at the advance. In foreign there was not the same decided improvement, imports of late having been free; but some sales of fine Danzig were made at 1s. per qr. improvement, and all useful sorts were very firm.

The imports into London for the four weeks were in English qualities 18,973 qrs.; foreign, 78,393 qrs., against 24,912 qrs. English, 44,005 qrs. foreign, in 1864. The general averages commenced at 41s. 9d., and closed at 41s. 1d. per qr. Those of London began at 43s. 8d., and closed at 43s., so that the decline in each case was exactly 8d. per qr. The London exports have been very trifling, say only 320 cwts. flour. The imports into the kingdom, for the four weeks ending 17th June, were—wheat, 2,436,305 cwt.; flour, 277,216 cwt.; equal together to 608,048 qrs.

The flour trade has been almost stationary through the month, and without activity. Norfolks opened and closed at 27s. to 28s. per sack. Barrels, from their extreme scarcity, have been held at quite retail prices, extra State having brought 23s. to 24s. per barrel. The top price of town-made has been without variation, say 40s. per sack, as for a long time past, and in the present state of the wheat trade there is more probability of advance than decline. The imports into London for four weeks were, in country sorts, 57,277 sacks; in foreign, 2,395 sacks, and only 50 brls.; against 54,393 sacks English, 305 sacks 19,747 brls. foreign, for the same period in 1864.

The barley trade, in the absence of any demand for malting, has been limited to the demand for distillation and grinding foreign, the English supplies having been very scanty, as usual at this period of the year. The fluctuations of value have been very slight—first towards decline; then, in consequence of the dry weather, towards an advance, leaving prices 1s. above what they were at the beginning of the month; and as grinding qualities have only been selling at about 21s. to 22s. per qr. of 400 lbs., we think the probabilities are more in favour of an advance than otherwise, as this price is below oats, while beans and peas have become comparatively dear. The imports into London for the four weeks were 1,551 qrs. English, 37,777 qrs. foreign; against 1,469 qrs. English, 14,459 qrs. foreign in 1864, making the foreign imports nearly treble what they were. Yet stocks on hand are small.

The malt trade has been very quiet through the month; but the best qualities were in firm hands, and holders were rather looking up than anticipating any decline.

There has been a great falling off this month in the supply of foreign oats, say to one-half of what they were in May; and as the dry weather has

made the appearance of the crop unpromising, almost every market has been reporting an advance of 6d. to 1s. per qr., till the rise has amounted to 2s. to 3s. per qr., or about 15 per cent. on the lowest value. The English and Scotch supplies have also been declining, while from Ireland very little has come, and but little can be expected till the new crop is gathered. A fall of rain might abate the pretensions of sellers; but it would come too late, in many places, to be of much advantage, as the sun has been forcing on the growth prematurely. We may therefore yet be dearer till the Russian supplies come in plenty. The imports into London for the four weeks were 2,329 qrs. English, 4,481 qrs. Scotch, 440 qrs. Irish, 105,245 qrs. foreign; against 3,102 qrs. English, 12,656 qrs. Scotch, 8,467 qrs. Irish, 78,919 qrs. foreign, for the same period last year.

There has been a great diminution in the supply of English beans, from the deficiency of last year's crop, and till the last week scarcely any foreign appeared. Prices all through the month have been gradually hardening; but the time of year being against a large demand, there has not been activity in the trade, more especially as the prices have been beyond speculation. The foreign supplies are almost limited to Barbary and France. The crop on the ground is said not to pod well for want of rain, and if the drought should continue, the gatherings must be very small, as the black fly generally comes in such cases. This grain must, we think, be dear for some time, as Egypt can send nothing. The imports into London for the four weeks were 1,303 qrs. English, 1,998 qrs. foreign; against 2,697 qrs. English, 1,053 qrs. foreign, for the same period in 1864.

In peas also, in consequence of the unfavourable weather to the setting and filling of the pod, there has been a tendency upwards, and a fair demand for low white foreign, for the purpose of cattle feed, has lately been experienced, making all sorts about 1s. per qr. higher. There are very great doubts whether this crop will turn out near an average; indeed in some places the idea of a crop has been given up, without a favourable change; therefore, we expect new white boilers will set in at a high price. The imports into London for four weeks were 317 qrs. English, and 4,458 qrs. foreign; against 207 qrs. English, 3,831 qrs. foreign, in 1864.

Linseed, with only moderate imports, and a steady export demand, has rather gained also in value, say 1s. per qr.; and cakes all through have found a good inquiry, which has been further stimulated since the failure of the grass. As the crops are again badly reported abroad, we expect it very likely that even yet higher prices may be paid next season.

In the seed trade generally very little has been passing. The small stocks left over of cloverseed, and the high rates paid for it, have prevented any speculation therein. It has been the same with trefoil; but the dry weather is against this crop, and we may have a repetition of high rates. Canary-seed has remained low-priced and neglected; but fine mustard-seed, both white and brown, have rather hardened in value.

CURRENT PRICES OF BRITISH GRAIN AND FLOUR  
IN MARK LANE.

	Shillings per Quarter.
WHEAT, Essex and Kent, white, old 41 to 49...new 41 to 49	40 43
"Norfolk, Lincoln, and Yorkshire, red.....old 40 43...new 40 43	40 43
BARLEY, "25 to 27.....Chevalier, new 28 34	28 34
Grinding, "24 26.....Distalling.....27 29	27 29
MAIZE, Essex, Norfolk, and Suffolk.....new 54 61	54 61
Kingston, Ware, and town-made....." 54 61	54 61
Brown....." 47 50	47 50
RYE....." 26 28	26 28
OATS, English, feed 19 to 23.....Potato.....22 28	22 28
Scotch, feed.....18 23.....Potato.....22 28	22 28
Irish, feed, white 17 20.....Fine.....21 24	21 24
Ditto, black.....17 20.....Potato.....21 24	21 24
BEANS, Masagan.....35 37.....Ticks.....35 37	35 37
Harrow.....38 40.....Pigeon.....40 46	40 46
PEAS, white, bolters.....36 40 Maple 36 to 39 Grey, new 34 36	34 36
FLOUR, per sack of 280lbs., Town, Households.....34 40	34 40
Country, on shore 27 to 29....." 30 33	30 33
Norfolk and Suffolk, on shore.....27 28	27 28

## FOREIGN GRAIN.

	Shillings per Quarter.
WHEAT, Dantzic, mixed.....42 to 46.....old, extra 47 to 52	45 46
Königsberg.....40 44.....extra.....45 46	45 46
Rostock.....41 44.....fine.....46	46
Siloesian, red.....39 40.....white.....41 44	41 44
Pomera, Meckberg, and Uckermark.....red old.....39 44	39 44
Russian, hard, 34 to 35.....St. Petersburg and Riga 37 38	37 38
Danish and Holstein, red....." 36 38	36 38
French, none.....Rhine and Belgium.....40 43	40 43
American, red winter 40 to 42, spring 39 to 41, white 43 46	43 46
BARLEY, grinding 21 to 24.....distilling and malting 25 29	25 29
OATS, Dutch, brewing and Poland 18 to 23.....feed 17 21	17 21
Danish and Swedish, feed 19 to 23.....Stralsund.....19 23	19 23
Russian, Riga 20 to 23.....Arch. 19 to 21.....Paburg 20 24	20 24
BEANS, Friesland and Holstein....." 34 37	34 37
Königsberg.....34 to 38.....Egyptian.....36 37	36 37
PEAS, feeding and maple.....33 36.....fine bolters.....36 38	36 38
INDIAN CORN, white.....29 33.....yellow.....29 31	29 31
TARES....." Lentils....." 31 33	31 33
FLOUR, per sack, French.....30 33.....Spanish, p. sack 31 33	31 33
American, per brl.....21 23.....extra and d'ble. 25 26	25 26

## AVERAGES.

A Statement showing the Quantities Sold and Average Price of British Corn, imperial measure, as received from the Inspectors and Officers of Excise, conformably to the Act of the 27th and 28th Victoria, cap. 87, in the week ended June 17, 1865:—

Wheat.....	51,802 qrs.	41s. 1d.
Barley.....	1,073½ "	27s. 3d.
Oats.....	2,161½ "	23s. 8d.

## COMPARATIVE AVERAGES.

A Comparative Statement, for the corresponding week in each of the Years from 1861 to 1864, of the Quantities of British Corn sold in the towns from which Returns are received under the Act of the 27th and 28th Victoria, cap. 87, and of the Average Prices as ascertained under the Act 5th and 6th Victoria, cap. 14:—

Years.	Qrs.	s. d.	Qrs.	s. d.	Qrs.	s. d.
1861	46,856½	53 9	2,058½	34 3	4,546	25 2
1862	40,738½	53 9	959½	33 3	3,868½	24 4
1863	58,406½	46 11	1,230½	32 4	4,925½	22 10
1864	70,298½	39 6	1,821½	27 11	3,636½	20 0

## LONDON AVERAGES.

Wheat.....	3,337 qrs.	43s. 0d.
Barley.....	"	0s. 0d.
Oats.....	163 "	26s. 5d.

## PRICES OF SEEDS.

LONDON, MONDAY, June 26.—The seed market remains quiet. In Red seed there is nothing passing. White seed has been more inquired for. New French Trifolium is at market, of fine quality, and is offered at low rates.

## BRITISH SEEDS.

MUSTARD, per bush., white.....	9s. 6d. to 10s.
CANARY, per qr.....	52s. —s.
CLOVERSEED, red.....	—s. —s.
CORIANDEE, per qr.....	—s. —s.
TARES, winter, per owl.....	—s. —s.
TRIFOIL.....	—s. —s.
LINSEED, per qr., sowing 56s. to 60s., crushing 54s. 58s.	54s. 58s.
RAPESEED, per qr.....	84s. 90s.
LINSEED CAKES, per ton.....	£9 10s. to £10 10s.
RAPE CAKES, per ton.....	£5 10s. to £6 0s.

## FOREIGN SEEDS.

CORIANDEE, per cwt.....	16s. to 18s.
CLOVERSEED, red —s. to —s., white.....	—s. —s.
RAPESEED, Dutch.....	—s. —s.
CARAWAY.....	—s. —s.
TRIFOIL.....	34s. 35s.
HARPSER, small —s. per qr., Dutch.....	—s. 48s.
LINSEED, per qr., Baltic 58s. to 60s. Bombay.....	68s. —s.
LINSEED CAKES, per ton.....	£9 10s. to £11 0s.
RAPE CAKES, per ton.....	£5 0s. to £6 0s.

## HOP MARKET.

BOROUGH, MONDAY, June 26.—We have no new feature to notice in our market, which continues steady, with a moderate demand for the best qualities of home and foreign growths, at our recent currency. The plantation reports are generally favourable, and give promise of an abundant yield.

Mid and East Kents...	130s., 160s., 200s.
Weald of Kents.....	120s., 140s., 155s.
Sussex.....	116s., 135s., 145s.
Yearlings.....	110s., 128s., 140s.

## ENGLISH BUTTER MARKET.

Dorset, fine.....	116s. to 120s. per cwt.
Do. middling.....	100s. to 108s. per cwt.
Devon.....	108s. to 112s. per cwt.
Fresh.....	12s. to 14s. per dozen.

## PRICES OF BUTTER, CHEESE, HAMS, &amp;c.

BUTTER, p. cwt.—s.	CHEESE, per cwt.—s.
Friesland.....116 to 118	Cheshire.....64 to 70
Jersey.....92 104	Dble. Gloucester.....66 70
Dorset.....116 122	Cheddar.....66 70
Carlton.....—	American.....66 64
Waterford.....—	HAMS: York.....96 80
Cork.....—	Cumberland.....96 80
Limerick.....—	Irish.....96 92
Sligo.....—	BACON:.....
Fresh, per doz. 10s. 6d. to 13s. 6d.	Wiltshire.....74 82
	Irish, green.....66 74

## OIL MARKET.

OILS.	PITCH.
Olive, Florence, ½.....	British, per cwt.....£0 5 0 to 0 6 0
cheese.....21 4 0 to 0 0 0	Archangel.....0 10 0 to 0 10 0
Lucas.....1 0 0 to 0 0 0	Stockholm.....0 12 0 to 0 12 0
Gallipoli, per 252 gallons.....53 0 0 to 0 0 0	
Spanish.....51 0 0 to 0 0 0	
Linseed, per cwt.....1 13 0 to 0 0 0	French.....£3 12 0 to 0 0 0
Rape, pale.....3 6 0 to 2 6 0	American.....3 10 0 to 0 0 0
Brown.....2 3 0 to 0 0 0	Rough.....0 11 0 to 0 12 0
Cod, per tun.....51 0 0 to 0 0 0	
Seed, pale, new 48 0 0 to 0 0 0	
Do. brown.....20 0 0 to 0 0 0	
Sperm.....91 0 0 to 0 0 0	American.....£0 0 0 to 0 0 0
Head Matter.....87 0 0 to 0 0 0	Archangel.....0 19 0 to 0 0 0
Southern.....44 0 0 to 45 0 0	Stockholm.....0 16 3 to 0 0 0
Cocoa Nut, per cwt.....2 3 0 to 2 4 0	
Palm.....1 11 0 to 1 17 0	

## RESIN.

French.....£0 12 0 to 1 5 0	Greenland, full size.....£2 00 0 to 0 00 0
American.....1 12 0 to 0 0 0	South Sea.....400 0 0 to 0 00 0

## PRICE CURRENT OF GUANO, &amp;c.

Paruvian Guano, direct from the importers' stores, or ex ship (80 tons) £12 5s. to £13 10s. per ton.	
Bones, £8 10s. per ton.	
Animal Charcoal (270 per cent. Phosphate) 25 per ton.	
Coprolite, Cambridge, whole £2 5s. to £2 8s., ground £3 15s. to £3 18s.	
Sulphur, whole £1 18s. to £2, ground £3 10s. to £3 12s. per ton.	
Muriate of Potash, £13 to £14 per ton.	
Nitrate of Soda, £15 to £16 10s. per ton.	
Sulphate of Ammonia, £14 to £15 per ton.	
Gypsum, 3s. per ton. Superphosphate of Lime, 25s. to 26 5s. per ton.	
Sulphuric Acid, concentrated 1 84s. 1d. per lb., brown 1 71s. 6d.	
Blood Manure, 26 5s. to 27 10s. per ton. Dissolved Bones, 26 15s. p. ton.	
Linseed Cakes, best American barrel, £11 5s., ditto bag £10 10s. p. ton.	
English, £11 to £11 10s. Rape Cakes, £5 15s. to £6 per ton.	

E. FUSSELL, London Manure Company, 116, Fenchurch Street, E.C.

Guano, Peruvian £12 7s. 6d. to £0 0 0	Linseed Cakes, per ton—
Do. Upper do. 5 15s. 6d. to 6 0 0	America, thin, bag, £9 5s. to £9 10s.
Kooria Moorla 0 0 0 to 0 0 0	Do. in bris. 0 0 0 to 10 10s.
Bone Ash 0 0 0 to 0 0 0	English 0 0 0 to 0 0 0
Brimstone, 2d. 6d. to 0 0 0	Coted. Cakes, Decort. 0 0 0 to 0 0 0
Saltpetre, Bengal, 2 per cent. 0 0 0 to 0 0 0	Linseed, Bombay, p. qr. 3 16s. 3 16s.
Nitr. of Soda, p. ct. 0 12 3 to 0 12 6	Rapeseed, Guzerat 3 0 0 to 3 10s.
Cloverseed, Amer. red, new per cwt. 0 0 0 to 0 0 0	Niger 2 0 0 to 2 10s.
	Tallow, ref. F.Y.C. 3 3 0 to 3 10s.

SAMUEL DOWNES AND CO., General Brokers, Exchange Court, Liverpool.

Agricultural Chemical Works, Stowmarket, Suffolk.	
Prentice's Cereal Manure for Corn Crops.....	per ton £2 0 0
Mangold Manure.....	" 6 10 0
Prentice's Turf Manure.....	" 2 10 0
Prentice's Superphosphate of Lime.....	" 2 10 0

Printed by Rogerson and Tuxford, 246, Strand, London, W.C.







*The Buffalo Water Buffalo*  
*The property of Mr. J. P. Chas. man of Union, Australia.*

*The Buffalo Water Buffalo*

## PLATE III.

### A LONGHORN STEER;

THE PROPERTY OF MR. R. H. CHAPMAN, OF UPTON, NUNNEATON.

This steer was bred and fed by Mr. R. H. Chapman, who considered him to be one of the best of the breed ever exhibited. In 1863 he took in prizes £25 and two silver medals, viz., first prize of £10 and medal at the Smithfield Club; first prize of £5 and medal at the Birmingham Show; and £10 at Leicester as the best ox or steer of any breed under four years old, bred and fed in the county. He was sold to the butcher at three years and eight months old for 50 guineas.

The longhorns have been bred at Upton for more than a hundred years. The founder of this herd, Mr. George Chapman, went there in 1745, and commenced selecting longhorns in 1756, when he hired a noted bull called Twopenny, from Mr. Robert Bakewell, of Dishley, and acquired the reputation of being a careful and judicious breeder of this sort up to his death in 1802. Bakewell once said that "George Chapman had one of the best herds of longhorns that he knew anywhere." For the next half-century purity of breed and usefulness for dairy purposes were cultivated in the herd by his son, Mr. Samuel Chapman, and this stock at the present time is in the hands of his grandson.

It is thus that a breeder rhapsodises on this now almost obsolete kind of stock, at least in the show-yard, where they are regarded chiefly as curiosities—"Previous to the year 1791 history does not afford such a case of extraordinary prices for stock as were realised at Mr. Fowler's sale, when a great number of breeders assembled at Rollright from almost every county in England. Two two-year-old heifers were re-sold at an advance of more than 40 gs., and Garrick, Sultan, and Young Sultan, which fetched £645 15s., or an average of £215 5s., might have been re-sold at an advance of nearly 50 gs. each. Eight years produce of Nell, daughter of Old Nell and Twopenny, sold for more than 1,000 gs. At the Croxall sale in 1811, Dishley Daisy and her calf were sold for £239 8s. Shakespear was knocked down to the bid of £420, and it is said that the enormous sum of 700 gs. was offered and refused for a longhorn bull named Tiger. An old writer says 'that

the superiority of longhorns of this period was a natural or constitutional property of furnishing meat upon those parts of them which sell for most by the pound from a given quantity of food.' What then, has been the cause of their going out of fashion? An extract from a letter of a short-horn breeder, who has been well known as a first-rate judge of cattle for the last half-century, will best answer this question. He says: 'I have no doubt, if the breeding of stock fifty years ago had been as well understood as at the present day, and right principles had been carried out, but that the longhorn breed of cattle would have occupied a very different position to what they do at the present time. I consider the breeders of longhorns of that period committed the same error as the breeders of Leicester sheep in breeding in-and-in, looking too much to fine and beautiful looks, and neglecting the strength of constitution and depth of flesh which always must be at the foundation of all good animals. I do think a good longhorn cow will produce as great a return for the food she consumes as the best animals of other breeds.' Another gentleman who is a warm admirer of shorthorns writes rather amusingly as follows: 'Certainly the best and handsomest longhorns I have ever seen I have seen recently, and, for longhorns, they are indeed fine animals. I admire the enthusiasm with which a few cling to this expiring race; it reminds me of the zeal with which the Stuarts' cause was upheld through family feelings long after the worthlessness of that cause, or rather of the Stuarts, had been recognised and doomed by the general mass of mankind; and I fancy some of the breeders of longhorns stick to them because their ancestors were breeders of the same kind for generations. I have read much of their history and am familiar with their ancient fame; but I am strong in the belief that they have been dispersed for better breeds, and will never be resuscitated again; a few good Tories may stick to them, as some fine old English gentlemen cling to knee-breeches and top-boots; but these fine old worthies will all soon follow the shade of the noble Sir

Tatton Sykes. All honour to their memories! they belonged to the best sort of the best Englishmen.' The vastly improved standard to which the longhorns have the last few years been<sup>o</sup> brought at our national shows, proves there is no fear of the above predictions being verified, and the more so as the long horns are in the hands of such men as Sir J. H. Crewe, Bart., Mr. W. T. Cox, and Colonel Inge of Leicester sheep celebrity. The show yard is considered the arena to decide the merits of various breeds; but if it is true, which is confidently asserted, that the longhorns exceed other breeds in dairy and cheese-making produce, with less food, it should be remembered that not mere appearance, but that which pays the most after expenses are defrayed, is the test of real value; for it has been well said that 'a well-filled cheese-room is the best furnished room for a tenant-farmer.' A writer on one of our national shows, a few years since, found fault with a longhorn cow for not being fat before she was seven years old. He entirely overlooked the fact that she had produced four calves, and made cheese and butter for four years, a feat which perhaps no other cow in the exhibition had done, and was then sent to the show with a year's feeding, and not forced from birth, as a great many animals are, for the sole purpose of exhibition. The longhorns appear to be a breed which can be profitably kept until a great age. Bakewell had a cow called Old Comely, which bred well, and lived to the age of 26 years, and when killed the fat on her sirloin was 4 inches thick; and we met with a butcher a short time ago, who stated that he killed one of this breed at 22 years old, quite fat also. There is no doubt but the Shorthorn "Herd Book" has been of great value to that breed; more recently the Hereford men have established one, and we recommend the long-

horn breeders to register such information and facts as may be most useful to guide them in the laudable endeavour to raise the breed to its rightful position. What breed can boast of a longer pedigree than the longhorns? Holme Pierrepont, Babraham, and Warlabey will ever have a mystic charm; these world-renowned places, with many others, have a thousand pleasant reminiscences of by-gone associations. So to longhorn breeders will Rollright, Dishley, and Brailsford ever be considered as classic ground. There are spots in most lands to which historical records give a national and lasting interest, some for heroic deeds of valour in the battle-field, and some for the victories of the manufacturers of food for our ever-increasing population; and it must be acknowledged that in the improvement of our domestic animals there is a wide field for the man of science and genius. Dr. Johnson observed that 'fox-hounds and race-horses are very fine animals indeed in their way, but it is a mistake to neglect the humble races of quadrupeds; for it is not denied that the ass, for instance, does more service in return for the cost of his keep and grooming than any other animal.' The longhorns have their peculiar and distinctive marks of character, perhaps more than any other breed. A white back, coloured sides, with some spots on the shoulder or thigh, and graceful curving horns; in some cases, in longhorns, brindled sides are preferred, of a dark cast, as it is generally supposed the darker colours indicate more strength of constitution. Some longhorn herds are wonderfully alike in character, the progeny hardly ever deviating from the pure type of their ancestors. It is recorded of Sir R. Gresley, of Drakelow, who bred longhorns some eighty years ago, that he took much delight in keeping a dairy of cows similar in colour and shape."

## PLATE IV.

### ON THE THAMES.

There is evidently something doing on the Thames, and most probably the annual boat-race between the two Universities, of which Oxford has

now all the pull, having won the five last matches in succession, and twelve out of the two-and-twenty contests that have been rowed off.

## FARM-YARD MANURE.

BY CUTHBERT W. JOHNSON, F.R.S.

Some years have now elapsed since the advantages of protecting the farm-yard from the weather seriously attracted the attention of the agriculturist. It was about the years 1850-53 that some valuable reports appeared on this important subject by Mr. Fisher Hobbs (*Jour. Roy. Ag. Soc.*, vol. xiv. p. 325), Lord Kinnaird (*ibid* p. 336), and Mr. J. D. Ferguson, of Glasgow (*Trans. High. Soc.*, 1851, p. 347). In the last number of the *Journal* of the Royal Agricultural Society is another very useful report, by Mr. W. J. Moscrop, of Kirkleatham, near Redcar. The subject of these papers is of very great importance to the many readers of this magazine, not only

in the preparation of manure, but for the welfare of their live stock. In open yards a very considerable amount of rain-water falls upon the manure, and, after dissolving a portion of its most valuable constituents, either soaks into the earth or drains away. Let us remember the amount of this rain-water, and endeavour to make some approximate calculation of the extent of the damage it causes to the compost of the homestead. In the home counties of England about twenty-four inches of rain annually fall upon the land. So that if we take a homestead covering only an acre of ground, then upon that extent of surface, about two thousand four hundred tons of rain-water, or



*Steamship on the River Thames.*

"On the Thames."

*Published by the London and North Western Railway Company, London.*



538,000 imperial gallons, fall every year. With this large amount of rain is mingled the urine of the live stock, which is much larger in amount than is always understood. Mr. Ferguson, in the report to which I have referred, calculated the number of gallons daily produced on a farm containing a certain amount of live stock. It is as follows:—

Cows, bullocks, and bull, 89, at 3 gallons	...	117
Queys 10, at 2½ gallons	...	25
Cattle one-year-old 30, at 1½ gallons	...	30
Horses, old and young, 16, at ½ gallon	...	8
Swine 15, at ¼ gallon	...	5
Total	...	185

Or for the whole year 67,525 gallons. Allowing that the horses are upon an average employed eight hours per day in the fields, and that the bullocks are also four hours in the fields, and deducting in consequence 8,151 gallons from the annual available amount produced in the farm-yard, there remain 59,374 gallons as the produce of a farm-yard containing the number of stock he has assumed.

The rain-water, moreover, mingles with and dissolves a portion of the solid excreta of the live stock, and thus the drainage-water from a farm-yard usually contains a variety of valuable fertilizing matters. The fluid draining from a dung-hill was long since analyzed by the late Professor J. F. Johnston (*Trans. High. Soc.*, 1846, p. 187). A specimen obtained from some heaps of cow dung exposed to rain being examined was found to be "dark coloured, and of course contained only what rain-water is capable of washing out of such dung-heaps. An imperial gallon of these drainings, when evaporated to dryness, left about 480 grains, or an ounce weight of dry solid matter. This solid matter consisted of—

"Ammonia	...	9.6 grains.
Organic matter	...	200.8
Inorganic (ash)	...	268.8
		479.8

"The inorganic portion contained—		
Alkaline salts	...	207.8 grains.
Phosphates of lime and magnesia	...	25.1
Carbonate of lime (chalk)	...	18.3
Carbonate of magnesia and loss	...	4.3
Silica, and a little alumina	...	13.4
		268.8

"Those, therefore (concludes the Professor), who besides allowing the urine of their byres to run to waste, permit the rain to wash their dung-hills, suffer a double loss; they lose the ammonia-producing substances, and much alkaline matter in the urine and the phosphates, a large additional portion of alkaline matter in the washings."

Next we may usefully compare the composition of this drainage-water with that of the urine of our domestic animals. Johnston was well aware of the value of these comparative examinations. He examined the urine of the sheep (*ibid.*, p. 809). He found in ten gallons of the urine 7 lbs. of dry fertilizing matter. The dry matter consisted in 100 parts of

Dry organic matter, containing nitrogen	...	71.86
Inorganic or saline matter	...	28.14
The saline matter or ash contained, in 100 parts—		
Sulphate of potash	...	2.98
soda	...	7.72
Chloride of potassium	...	12.00
sodium	...	82.01
Carbonate of soda	...	42.25
lime	...	0.82
magnesia	...	0.46
Phosphate of lime, magnesia, and iron	...	0.70
Silica	...	1.06

We see, then, from the result of these examinations, that the drainage of the dung contained one ounce of

soluble matter per gallon, whilst the urine of the sheep contained about eleven ounces. If we suppose, however, that the farm-yard contains one acre, the stock is it to be the same as that in the calculation made by Mr. Ferguson, and the rainfall 24 inches; then the amount of rain-water annually falling upon the farm-yard dung is about eight times as much as that of the urine of the live stock. This calculation is made, mark you, upon a homestead of the driest counties—in those districts where far more rain falls, the soakage, or drainage, from the yard is of course much more considerable.

If, then, the effect of exposure to rain and sunshine in an open yard impoverishes the dung, we ought to find that the manure collected from covered yards is much the most powerful in its effects. The comparative experiments which have hitherto been made seem to prove the reliability of that conclusion; thus in some experiments of Lord Kinnaird on the action upon potatoes of farm-yard dung prepared in covered and uncovered yards, and upon the following crop of wheat, this last receiving in the spring a top-dressing of 2 cwt. of Peruvian guano per acre, one acre of each produced potatoes, in tons, cwt., and lbs., wheat in bushels and lbs., and straw in stones of 82 lbs. as follows (*Jour. Roy. Ag. Soc.*, vol. xiv., p. 387)—

	Covered dung.	Uncovered dung.
Potatoes	11 17 57	7 6 8
"	11 12 26	7 18 99
Wheat	55 5	41 19
"	53 47	42 38
Straw	230	152
"	210	160

Then upon grass-land we have the experiments of Mr. Moscrop (*ibid.* vol. i. N. S. p. 93), who tells us that in a trial made on some meadow land, thoroughly exhausted by many consecutive years of mowing, the following results were obtained from the separate application of manure made in covered and open yards:—

*Uncovered Dung.*  
15 loads per acre produced 16 cwt. hay.

*Covered-yard Dung.*  
15 loads per acre produced 25 cwt. hay.

A portion left unmanured barely produced 10 cwt. per acre.

Owing to peculiar circumstances, the difference in this case was greater than on an average can be reckoned on; but this and many other similar comparative instances within the range of the writer's experience clearly prove that the advantage arising from the superiority of the manure made in covered yards is in itself sufficiently important to warrant their very extensive adoption.

Other reports, all tending to show the greater strength of the covered farm-yard manure, have been made by various practical farmers. Some of these have been collected by Mr. Moscrop in his recently published valuable Essay on "Covered cattle-yards." For instance, an Oxfordshire Farmer, Mr. Akers, of Black Bourton, remarks:

"I have at my farm an open yard as well as my large covered yard, and when I first used the manure made in the latter I was startled to find my crops for which it had been applied so lodged as to be almost worthless. Since then I have sometimes been at considerable expense to have that made under cover and in the open either mixed or applied conjointly, so as to ensure an equal crop; or when the covered-yard manure is used separately, the quantity is invariably reduced, so as to guard against my previous misfortune. I usually manage my covered manure so that it will 'spit' out with the shovel when required for use, so that I have no need to haul it into a field heap, and I consequently save the usual labour of twice filling, carting, and emptying."

The same results are obtained from a covered-yard in Berkshire, since Mr. J. C. Garth, of Naine's Hill, tells us that "the manure is first-rate; but as I have not made an actual trial, I cannot decidedly say how much it is better than that made in open yards; but perhaps one of the principal advantages of covered-yards is the great superiority of the manure. The cattle should be littered every day, or every other day; the liquid is then all absorbed by the straw. The dung is good and short, and fit to be drawn on to the land without the expense and waste of making dung-heaps. I consider this system of manure-making is also more healthy for the cattle, as in open yards the liquid runs about, emitting effluvia and tainting the soil, whereas in covered yards it is all taken up by the straw."

Similar results have been obtained by the use of covered-yards in Essex. Mr. F. Chancellor, of Chelmsford, observes:—

"The late Mr. James Beadell always stated, as the result of his lengthened experience (and he might be considered as one of the pioneers of the system), that *one* load of covered-yard manure was worth more than *two* loads of open-yard manure.

"Its tendency to get dried and heated has always been advanced as an argument against covered-yards by those who have not tried them, but I never heard it used by any one who had. The truth is, it keeps infinitely moister than in open yards in a dry season. I have often seen the manure when being emptied come out like 'black butter,' and, with perhaps the exception of the top layer, quite fit to put on the land."

An excellent Yorkshire agriculturist, Mr. H. S. Thompson, of Moat Hall, gives similar evidence. He remarks, in a communication to the author of the essay to which I have referred—

"When first I began to use manure made in a covered-yard, it was put on for white turnips in the usual quantity, and they were stimulated by it to an unnaturally rapid growth and excessive size, which were very prejudicial to their keeping qualities. This taught me the lesson, which has since been abundantly confirmed, that manure made under cover is fully one-third stronger than that which has been exposed to the rains of winter in open-yards."

If a much less quantity of the manure from covered yards is required than when that from open yards is employed, then, as a consequence, it follows that by its application less labour is expended; and, moreover, as Mr. Mascrop well remarks, "owing to the lesser quantity of litter used, the excrements of the cattle bear a greater proportion to the whole mass when manure is made in covered yards, and, after lying some little time, turns out quite fit for direct application for any description of crop, whereby a very material saving of labour is effected. Assuming twenty tons of ordinary open-yard manure to be a fair dressing per acre, and that thirteen tons of covered-yard manure would be quite as effective, we, in this respect, save the cost of the application of seven tons per acre, which, on an average, is certainly not less than 8s. 6d. And besides, in ordinary practice, the open-yard manure would be carted to the fields to ferment in a heap previous to its application; and the labour involved in refilling, carting, and emptying may be put as 4d. per ton, or 6s. 8d. per acre, showing, in the aggregate, a saving of 10s. per acre; and this we believe to be a very moderate calculation. Moreover, the straw which is saved in the litter becomes available for food; and if there is any truth in estimates which set the feeding value of straw at 38s., and the manurial value of straw at 12s. 6d. per ton, the gain in this respect must be considerable."

But what say the opponents of covered yards? (and what agricultural effort, from the days of Jethro Tull and his drill and horse-hoe husbandry, down to the year of grace 1865, has not been favoured with a stout oppo-

sition?) They tell us that "it makes the stock tender—renders them susceptible of cold when afterwards turned out." Others, who have constructed yards full of draughts, on the contrary inform us that the stock catch more colds in covered yards. But what is the evidence of those who have thus protected their cattle? Speaking of the live stock, Mr. Mascrop remarks:

"They have a dry lair, and are comfortable. They do not range uneasily about, or, with staring coats, shivering, stand exposed to the 'pelting of the pitiless storm,' like their less fortunate fellows in the open yard, but with comfort eat their food, in comfort rest, and for such comforts show their gratitude to their owners by their rapid development. In an experimental trial we proved that, under cover, animals, each of which had a separate box, gained as much weight, with something under an eighth less food, as others fed with the same description of food, but kept in the common form of court and shed, where the open part bore to the shedding the proportion of four to one. The gain was nearly one shilling per head per week, which was entirely attributable to the superior warmth, comfort, and repose enjoyed by the cattle under cover. But, besides fattening on less food, animals enjoy better health, and are less liable to disease under cover than when exposed, in open or partially covered yards, to the rigour and changes of our variable climate. In a yard constructed as shown by the annexed plans [annexed to Mr. Mascrop's paper], while the cattle are sheltered and comfortable, they enjoy perfect immunity alike from thorough draughts and from a vitiated atmosphere. The fluctuations of temperature in our island are frequent and wide; but the tendency of such a yard is to equalize and control that temperature, and within its precincts winter's bitter blasts and summer's intense heats are alike unknown. The great importance of this in the economy of animal life will be readily seen; for whence comes that fatal train of maladies, coughs, catarrhs, inflammations, consumptions, but from exposure to sudden variations of temperature? We catch cold. Granted that animals are not so sensitive as man; nevertheless, even to them alternations of warmth, wet, and cold are most productive of disease. That cattle kept in covered yards enjoy better health than others kept where the cover is only partial is established by abundant evidence. In support of this view, we quote the following from a communication with which we have been favoured from Mr. J. G. Marriage, of Ham Farm, Red Hill: 'Our buildings are 180 feet by 103 feet, and afford accommodation for 190 head of stock; and to give you an idea of the health they enjoy, I may state that for the last seven years the farrier's bill has not averaged twenty shillings per year.' But there is yet another class of opponents to the covered-yard system, who, while admitting the general well-doing of the cattle kept in them during the winter, argue that what is then gained is lost in early summer, when the animals are turned to grass, from their great susceptibility on exposure to cold. The writer's own experience, and also that of many others whom he has addressed on this matter, is dead against this view. With much more apparent justice might it be inferred that milch cows, which are usually kept in a much closer, warmer atmosphere, would catch cold when turned to grass; yet, as a general rule, such is not the case."

Upon the importance of these practical researches it is needless to enlarge. The reader of this magazine well knows how large is the outlay of the farmers of the present time for artificial manures. This great expenditure is made to aid the manure of the yard; and for this purpose even many foreign countries contribute their fertilizing matters. When, then, we shelter our farmyards, we are helping its manure—since by preserving its strength we very largely increase its fertilizing power.



## ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

## MEETING AT PLYMOUTH.

"From John O'Groat's to the Land's End" has been the signal cry of the Royal Agricultural Society; and our marching orders take us in turn from the uttermost North to the extreme West. It is seldom, indeed, that two such long journeys have followed so immediately one upon the other; whilst the regular visitors have not been inclined to regard this extra call upon their capabilities with the best grace. Plymouth, after all, may pay better as a meeting than was at one time expected; for, thanks to the countenance of their Royal Highnesses the Prince and Princess of Wales, Wednesday brought a really good attendance, more money being received than on the same day in the Newcastle week. There is no question, however, but that many a familiar face was missing; and the suggestion for holding the show, say, every other year, in London was again discussed, as with more probability of this idea ultimately coming to some definite proposition. The elections probably detained some people at home, as the same cause tended to hurry others off again at the earliest opportunity; but the entries, of themselves, spoke significantly enough to the out-of-the-way situation selected, as to the comparative difficulties under which this could be reached. In truth, a more deliberate examination of the several sections only goes to confirm our first impression. The show is, generally, a short one, and only in places a good one. Let us take, for instance, the opening classes of the catalogue; and it is long since two smaller or worse entries of shorthorn bulls than the all-aged and the two-year-olds were ever seen at a Royal meeting. Of unmistakably the best of these, Mr. Sharpe's The Lord Chancellor, we thus wrote when we saw him at Hereford the other day, where he was also the best of his class:—"The bulls were almost generally indifferent; but the best of these is an animal of some repute, known as Lord Chancellor, and purchased by Mr. Sharpe, at the Babraham sale, for 400 guineas, where he was a general favourite, as pronounced far superior to the Battersea medal calf, First Fruits. The Chancellor, however, has not gone on so well as he promised; and, good as he is in his quarters, grand about his head, and rich in his colour, he is so palpably deficient forward as to prevent his ever taking any very high rank in good company; still, he won at Tunbridge last autumn, and was the best bull, also, in Coorwall this summer, where, it is said, he beat a very good class." Indeed, the second at Falmouth was again second at Plymouth, Mr. Bolitho's Favourite, a Cornish bred one of good quality, but by no means remarkable for any further excellence; while the third, another native, is a smart but delicate-looking animal, with nothing like the substance of Mr. Clayden's altogether unnoticed Marquis of Cornwallis, a bull whose merits were, perhaps, more continually discussed than those of any other entry that failed to catch the eye of the authorities. But then the judges, try him where you would, have seldom appreciated the Marquis as they should have done; and it is now said that we shall see him no more. The two-year-olds were a yet weaker class, though with the winner worthy of his place, the Duke of Devonshire being a long, low, and level bull, but not quite so good to the hand as the eye; whereas, Baron Blencow is of fine quality, and of mean appearance, not having gone on since Newcastle, where he showed a small beast, as he gives now still less promise of developing. The yearlings were better, led off,

as these and the bull-calves were by two own brothers, the property of Mr. Fawkes, of Farnley, and a long way the choice of all the bulls. They came out amusingly alike when led into the the ring, where they showed capitally, having a deal of style and character, not merely in their looks, but in their action, while they were as grateful to the touch; and, with lots of length, famous loins and backs, the Yorkshire brothers made a great impression. Friar Tuck, the elder, will most probably be always the better of the two; but the Cornishmen were also nibbling for Friar Bacon, whose price was put at 800 guineas. The Waraby second had little beyond his quality in his favour, for he was out of all form, and begins badly at the best of times, with a plain cowy head; though there was no award the Judges, "at his age," maintained with more determination, despite the continual cavil urged against their opinion. The third prize is a very nice son of First Fruits, better, in fact, than we should have quite reckoned upon from that overdone youngster, out of Miss Battersea, a cow which was purchased at the Babraham sale when in calf with this bull; but there is not much to commend in Lord Lovell the Second, and the Marquis of Cornwallis's son threatens to be as coarse as his father. Baron Rothschild's second-best bull-calf is so far but a light and narrow one, and it was idle attempting to compare anything else here with the Farnley Friar. There can be no question, either, but that the credit of the Shorthorns was fairly saved by the cow and heifer classes, or by some of the latter more particularly, although there were some very good specimens amongst the dowagers. The first of these, Mr. Wood's Corinne, has been very judiciously reduced since we saw her in Yorkshire last summer, and now looks sweeter and handsomer than ever; whereas Diadem, fine cow as she is, was far too big, and, consequently, did not show to advantage when put upon parade. Mr. Sharpe's very pretty cow was again just behind Mr. Stratton, and a little nearer than at Hereford; while Frederick's Farewell is wearing better than some of the costly treasures from Towneley, and Lady Pigot's Perfume is a very lesson of how an animal should be prepared for the show-ground, for rarely have we seen one so beautifully got up. The heifers in-milk or in-calf were numerically by no means in such force as their younger sisters, although we owe some apology to the best of them, Lady Fragrant, in whom there is an extraordinary improvement since we last saw her; and she has now developed into a really sweet animal, full of the best female character, with a pretty head and placid expression, a rare quality of flesh, and as light in her bone as a roe-deer. The Lady of Rosales is another handsome well-grown heifer; Mr. Stratton's, just out of her class as a yearling, also a good one; and to Mr. Logan's second-prize we gave something of a character when we so recently met her at Hereford, as "a handsome heifer, deep, square, and light in her bone, with nice quality, and altogether bound to make a favourable impression go where she will." But the great class of Shorthorns at Plymouth was that of yearling heifers, and where, beyond any consideration of individual merit, there was something like an entry, no less than twenty-four being nominated, and eleven of these noticed by the judges. After a deal of drafting and sifting, the winner was de.



clared to be Lord Feversham's Princess, to which, as we said at the time, there was nothing superior amongst the calves at Newcastle, "handsome and true, as well as a capital mover." Still, she only got second in the North to Baron Rothschild's Isabella Graceful, a clever heifer forward, but since grown bad about her quarter ends and the setting on of her tail, so that she reached no further than a commendation in the West; while the Princess has, no question, improved quite as much in proportion as the other has gone back. The strength of this class may be inferred from the fact of Mr. Charles Howard's pair of really good heifers getting no nearer than commendations, the second premium being claimed by Mr. Tennant, who is doing every justice by his Towneley investments, and bringing them out in famous form; and the third by Mr. Wood, of Stanwicke, who also showed a calf out of Corinne, that, however, was not any great credit to his mother. In the small show of heifer-calves, the touch of Mr. Pawlett's Charmer fairly placed her where she finished; but the opposition was not very formidable, and the class created but little interest in comparison with the older animals, as we much question, in fact, the advantages to be derived by the encouragement of such early maturity as is here occasionally exhibited.

There was a very *select* company of Herefords, and animals that have been meeting one another about the country any time for the last three or four years came together once more to try their fortunes. Conspicuous amongst these was Battersea, whose place of third instead of first in the old-bull class made something of a sensation. But then Battersea was at Tewkesbury last week, and at Hereford just previously, and the consequence of these continual migrations is that he has quite lost his touch, and is altogether gone off. The bull to which he had here to succumb, Mr. Read's Peremptory, is not unknown in the prize-list, while he showed now very fresh and well, and is a very good, useful animal, lacking something of Battersea's neatness, but a low, deep, thick bull, with plenty of constitution, and the right smack of the Hereford in his quality. The only way in which we should dispute the award would be over the Chieftain's second place—a plain patchy bull, standing very bad on his hocks, that we never could quite appreciate. The Commodore, again, has been no great favourite of ours, but he is going on well, and was once more fairly the first of a Royal class, so that his portrait will be alike admissible in the *Farmer's Magazine* and the *Herd Book*. Dinedor, the best yearling, we have spoken to lately, as having a handsome head and good forehead, but as being mean in his quarters, while Sir John his second here, is a lengthy bloodlike young bull, and the third, Douglas, a smart light animal, with more fine character than substance. The best bull-calf, all over as handsome as a picture, is worthy of the Stow herd; and of Duchess of Bedford, and Mr. Walker's pair of great grand cows, our notes would be but the echo of what we have previously said, though the class was not up to the high excellence of the Bath and West of England entry at Hereford. In the heifers in-milk or in-calf, Miss Hastings and Mr. Pitt's heifer reversed their previous places, and the former thus scores her three firsts at the Royal Shows; but for our own part we prefer the other reading over the merits of these rival beauties. As with the Shorthorns, the Hereford yearlings made up a famous as well as a comparatively numerous class, with everything noticed, and every animal commended duly named in the prize-list, which is certainly making the most of it. The Halston herd was here also to the fore, with a deep, heavy, but shortish heifer, and the Hereford decrees were again reversed over Fairy Queen, the prize calf at Newcastle, and Mr. Turner's Queen of the Vale, who beat Mr. Monkhouse with her when they last met, and, to our own thinking, should have beaten

him again. Some of the other heifers noticed here figured in that famous local division at Hereford, and, liberal as were the judges with their compliments, there is no doubt but that these favours were fairly won. In certain cases, however, the Hereford judges were thought not to be so agreeably employed, and over the question of the old bulls they went into different lobbies, with the result of the division as recorded in the prize-list.

With the exception only of the Royal Meeting at Exeter, this is said to be the largest entry of Devons ever brought together; and certainly the numbers here shown stand out in marked contrast to the few generally exhibited even at the shows of the Bath and West of England Society, where the management would not now appear to find much favour with the Devon breeders. The business opened well, with the whole class of aged bulls commended, but, at the same time, with the three prize animals as far away the best of the order. The winner, Sobieski, who has been leading a public life for some years, has never been beaten since he won at Falmouth as quite a youngster. He is a very handsome, thick, square animal, with plenty of size to back his breeding, but getting a little soft in his touch, from his continued preparations, or from being kept up to show pitch. Mr. Davy's second has all the true North Devon character with his wild eye, compact frame, and active movements; and Constitution, as we have had occasion lately to say of him, he is very bloodlike, but with a delicate-looking constitution after all. The generally-commended lot were coarser, and, as it struck us, with one or two just thrown in to make the compliment complete. There is nothing more full of promise than Lord Falmouth's capital two-year-old bull, very handsome and high-bred, with a good, firm touch, and on all points bound to go on; while he was backed by a nice lengthy one of Mr. Buller's breed for second, and a coarse plain beast of Mr. Farthing's for third, which, in anything like good company, can never hope to get any higher. Mr. George Turner was once more in all his wonted strength amongst the yearlings, another generally-commended class, wherein he took first and second with two young growing bulls of very high quality, and not much to choose between them; while Mr. Davy had another pair, that we had marked down as worthy of some notice before we heard of the honours they shared with their fellows. The first bull-calf was a very good one, beating his second all over for fashion; and the cows another wonderful lot, over which one jumped at conclusions at once, and commended them all forthwith, whatever the judges might or might not have done in the matter. Mr. Davy's first, almost as perfect as it is possible to make an animal, has never been exhibited before; but what with her sweet deer-like head, her light neck, her rounded frame, and small bone, they could not get away from her, though the second, another handsome middle-aged Beauty, has done some execution in her day, having been the belle at Bristol last summer, where Mr. Merson sold her for a hundred guineas. Mr. Quartly's third is a clean pretty cow, and we might go on to individualise the others, such as Gold-cup, Picture, Brown and Cherry, only to prove how much the Devons should be respected, when, like the farmers of East Norfolk, they are properly represented. The Royal Rose of Denmark, lengthening out a little, took another step as the best of the heifers in-milk or in-calf, but the class was not a very strong one; whereas all the yearling heifers were good, as all once more commended, and Mr. Turner considered he had nothing better on the ground than his commended one; but then "all of them were so good." They looked to have more size too, with quality, than we commonly find in these juveniles, and Mr. Davy's first and third were wonderfully well grown, the second being very thick and deep, and the other developing as kindly as a peach.

There were plenty of other prime animals in this class, and hardly a bad bred one amongst them, as it was satisfactory to notice the really high-bred look of Mr. Farthing's best heifer calf, where Mr. Smith closed up with quite "a little deer" for second, and Mr. Davy was getting out of his Lady Loves at almost anything he chose to ask for them, no matter whether they had won outright, or, like nearly all the rest of the Devons, been commended by everybody. The local classes for Devons were not so strongly filled; but Viscount, looking fresher and less beefy than he has for some time past, paired well with Jenny and their daughter; and the Stowey herd also furnished a couple of good cows in couples, fairly beaten as they were by Mr. Taylor's two—old Lovely at twelve years old, and Vaudine, from the Beacon Downes, herd at eight years old. The pairs of Devon heifers did not produce much competition, but in merit they were nearly all up to the standard of a very high average. In fact, it was something to talk of, to win amongst the Devons at Plymouth; while with as much blood and true character as ever, it struck us that the breed has of late been cultivated more carefully in regard to such essential elements in these days, as size, substance, and constitution.

The other kind of stock yet more peculiar to certain districts in the West made no such stand, as no animals on the ground commanded so little attention as the South Hams. The classes were very thinly made out, and the cattle themselves offered little proof of that worth they are said to inherit. There were certainly a few useful cows, and milk is the great merit of the breed; but the bulls are coarse and gaunt, and the uninitiated stranger can scarcely at sight appreciate what those who know the sort best adhere to so persistently. One only turns the more readily, when thus tutored, to the Longhorn in "the other breeds;" and Old Sparkenhoe is a really good bull, unmistakably surpassing the Suffolks shown against him. The latter again depend more upon their milking properties than any especial symmetry of form, and Sir Edward Kerrison sent in some of the best of his herd, nearly all winners about home, and occasionally heard of elsewhere. The other red cattle were the Sussex, which, as at Newcastle, were quite out of their reckoning, saving perhaps as claiming some distant relationship with the Devon; and the Messrs. Heasman had again to stand forth as the champions of their order. The old bull was declared to be a very good one, and one or two of the heifers had some personal recommendations; but it is a very serious question whether a variety of stock that, year after year, can muster so few representatives, should not merge into the one common section of all sorts? Our own opinion is, as it has been, that special classes for such animals as are identified with particular localities should only be provided when the place of meeting is within what may be called easy reach, as either Plymouth or Newcastle certainly was not. It was assumed on some such similar "reason why" that the Channel Islands cattle now came in such numbers, although the Jersey and Guernsey breeders themselves declare that they would the rather send on to London than Plymouth. However, as it was, the Islanders contributed one of the great features of the occasion, the public pointing their admiration by becoming very free buyers, most of the stock being sold out. Still these bargains did not include the first prize heifer, Mr. Eli Nicolle's Brownie, one of the most complete specimens of a Jersey ever seen. A light, soft brown in colour, she begins with a beautiful head, cleanly set on to a nice light neck, and with all the others of the thirty-six points almost at perfection. At two years and five months old, and in-calf, sixty guineas were refused for Brownie, whose owner has a large herd, which he cultivates with all proper care. There were some really slightly

animals amongst the old bulls, though your Alderney sire is not commonly a show beast; and the cows, of course, were pretty generally commendable, but the young bulls were almost altogether inferior, and it was only upon compunction that the premiums in this class were all awarded. The judges in their report dwell with especial emphasis upon the excellence of the heifers, while they draw the attention of the Society and its officers to the difficulties which present themselves in a mixed class, contending as they do that the two breeds of Jersey and Guernsey cattle are totally different! As a consequence they go on to recommend, should the entries henceforth equal those at Plymouth, that some distinction should be made and the several varieties classified, as we do the Devons and the Sussex. There is little doubt but that such a show may be kept going under the auspices of the Royal Society, and we would counsel the Islanders to continue worthy of encouragement, which they may turn to good account. Let them keep to purity of pedigree with all their famous "points," and they will never tire out their customers.

The horse section of the show was admitted by all to be a very poor exhibition, giving as it did, with a few exceptions, scarcely an average sample of any of our different breeds. The hundred and twenty-five pounds offered for the best and second-best sires calculated to improve the sound and the stout thorough-bred horse brought but one candidate—the good-looking, stout-limbed, muscular Motley, who came right away from the far North, but making a half-way house of the Agricultural Hall last week, where he was also awarded a prize. Last year he took that for hunter stallions at Newcastle, having only one competitor to beat, and that one but a poor cripple. Motley has, however, all the good points of his sire Touchstone, as well as his bad, being almost as like him as two peas, with the short shoulders and light girth. He is all over by his looks calculated to get the sound and the stout, if not the best of shaped ones; at any rate he was by a long way the best on the ground at Plymouth, and came in for a fair share of admiration. For the other thorough-bred hunter premiums there were six entries, one of the six being a carty roadster, who, although he was paraded before the judges and on the ground daily afterwards, of course never had a chance, not being anywhere near thorough-bred on either side of his head. The five in comprised 'Ali Pacha,' a dark-brown four-year-old, a compact, deep-ribbed, short-legged horse, with a bad neck and anything but hunting shoulders; in fact, he looked more adapted for getting stylish harness horses or filling the place of a charger, as did the light-boned Blenheim; whilst Stanford had a half-bred appearance about him, and all over anything but the stamp of a hunter sire. Of the other two who took first and second prizes, The Bald-faced Stag is a very heavy-topped horse, with great quarters; but he struck us as being all of a heap, and more likely to get cobs than hunters, although we hear he has had a great many mares during the season. Paul Clifford, the second, has a waspy light middle and big limbs, the fore legs being anything but straight. The hunting brood mares were a fair sample, Mr. Barrett's Kitty being a mare of much character, with a thoroughly varmint look and sound limbs, barring her hocks; while the second, Mr. Brereton's Countess, was as long and low as a turn-spit, but she had a certain sort of Suffolk softness about her that did not please. The Banker's Pet was more like a hunter, with the far-famed old Belzoni head; and Mr. Raby had a neat bloodlike cheesnut in this class, known as Miss Romford. Of hackney brood mares there were three, and as many prizes; the first being The Wren, who looked as if she had been a neat, game, wiry little hack in her time; the second, Bridesmaid, being a fine deep roomy

mare, of great character, with good limbs, and a fair mover, as promising to throw something valuable; and the third, Useful, a well-named mare, though rather heavy in her action. The first-prize stallion pony not above fourteen hands was Sultan, an Arabian, as, moreover, about the best-shaped one and best mover of the breed we ever recollect having seen; the second, Young Bobby, was a lengthy serviceable animal; but the third prize was very justly withheld for want of merit. Amongst the mares not exceeding fourteen hands, Alice Bray is a short-necked, waspy-middled animal, and rather leggy, but with fair action; the second, Princess, being a very lively lady, who, with a little less back hair, might have improved her good looks; and the third entry, Comet, a handsome, lengthy, short-legged mare, a long way the pick of the three, but disqualified, from disease in the hocks. For four-year-old hunters, Mr. Battams took first and second; his first being a good-looking compact mare, up to weight, and showing a deal of quality, with fine action in her trot, but rather clambering and labouring in her gallop; the second, Sultan, a black, was a grand style of servant's horse, and, we thought, would be well placed with a welter huntsman up in the centre of his pack, in some stiff midland country. He has a rather big but sensible head, and longish pasterns, but goes like oil in all his paces. These were both by Kingmaker, as was the five-year-old prize hunter, without any opposition to encounter, and also the property of Mr. Battams; and a compact, truly made, muscular horse he is, well knit together, and knowing how to use his legs by the way he brought them under him. The Rev. A. C. Thynne also showed one by Kingmaker in the four-year-old class, a horse with a pig eye, badly set on head, roached back, and pump-handle tail, that we could not fancy by any manner of means; but Mr. Trelawney had a couple of small blood-like nags, perhaps more suited for Devon than the others. Of the roadsters under fifteen and an inch, out of four entries, two were disqualified for being over the height, namely, Mr. Horswell's thick cobby trotter, and a nice hack or hunter by Nutshell, a chesnut, with white legs, the property of the Rev. J. Woolcombe. The first prize mare was a model of a blood hack, and again by Kingmaker, as the second was lengthy and useful, but rather common-looking. With only two entries for Dartmoor stallion ponies, Little Wonder, eleven hands high, was first, beating a handsome brown, Kohinoor, who, bigger and better made, was not so nice a mover as the little one, and thus fell in for second honours. For Dartmoor mares there was no entry whatever. The first for Exmoors went to a blood-like corky little bay, with splendid action; and the second to a thick-built chesnut, with a white mane and tail, but not much of a mover. The mares not exceeding thirteen hands were three in all, the first of which, "Sally," is a perfect model of a racehorse; the second, Multum in Parvo, a common-looking bay, with a drooping quarter; and the third with a strong cross of the donkey all over, but said to be a true Exmoor! if so, the sooner the breed is improved upon the better.

The cart-horses were not much better represented than the nags, the Duke of Beaufort's Sir Robert in the all-aged class, with his magnificent frame, short legs and good action, throwing all the others into the shade; as Waverley, the second prize, was a lump of a horse, with a head as big as a coffin, and Boxer the third not much to look at. The two-year-old prize stallion Young Conqueror is very useful; King of the Vale a good stepper, and Albert a deep, short, cobby animal. "Brown," with twins by her side, the first for mares and foals, with three prizes and four entries, is stout and deep, falling-off behind; but Stout, barring a little too much hair, is a handsome light cart-mare. Blossom is strong and well-made,

and the unsuccessful one of Mr. P. H. Turner, another Blossom, a deep, short-legged, active-looking animal. The three-year-old Bessy, with two prizes and one entry, was deep, level, and long; and of the two-year-olds, with a prize for each, Rose was nice looking, with a kind head, and Alma light, lengthy, low, and useful. There were nine Suffolk to eight prizes, Sir Edward Kerrison taking three with some good specimens, but it would be idle to descant on the merits of a breed so poorly represented as the chesnuts were in the West, and where any man who made an entry was pretty sure of getting a prize.

Professor Varnell thus reports upon the soundness of the horses exhibited at Plymouth: "The number, including all classes, is, I believe, ninety-two. Of these, three only were affected in the wind, two of which belonged to the class for agricultural stallions, and one to the class for hunter stallions. It is gratifying to observe that no disease of an hereditary nature was observed in the eyes of any of the horses; but disease of the hocks was more prevalent, including what is termed 'bone and bog spavins and curbs.' The cases amount to about seven per cent., which must be looked upon as a large percentage. Shelly, flat, and brittle hoofs were by no means numerous; and I observed them in but four instances only, viz., two in the Suffolk stallions, and two in the class of agricultural stallions shown for the local prizes."

A more deliberate review of the sheep went to prove a fair average show, but with nothing very extraordinary in any of the classes. The Leicesters were perhaps more evenly good than any other breeds, and, according to the judges, evinced some decided reaction on the part of the flockmasters. Mr. Borton, however, still held his lead in a large entry of shearlings with the now famous Yorkshire-Leicester, a very useful sheep for the farmer, if not quite so fine in its character as some other flocks. The prize-list will show that many of our best men were in competition; whilst others, like Mr. Pawlett, Mr. George Turner, and Mr. Tremaine, though with a number of entries standing to their names, never received any official recognition. Amongst the old sheep the three prize rams were capital samples of the sort, the first being a fine handsome sheep of very high character, although thus far with no rank in the showyard, having been employed at home for his owner's use, since Mr. Creswell purchased him at the Holmepierrepont sale for 62 gu. The Ravenstone third is another capital ram, and the Barton second was the first shearling at the Royal and Yorkshire meetings last season, so that something of the quality may be gathered from this, though the general strength of the class was not equal to the front offered by the younger sheep. The shortness of keep, it is said, has prevented many breeders exhibiting, and there were certainly but few pens of ewes, and these not of a very high class, though Mr. Stamper's prize lot were neat and uniform, and Mr. Gould's commended pen, for style and quality, about as good as anything in competition against them. The Leicesters were selling, and some of the Cotswolds are also going into Cornwall, but it was by no means a grand display of the latter, many of the best breeders, like the Gurnes and the Lanes, holding off, and leaving the honours to be divided amongst breeders of less repute. Mr. Walker's, however, is a very fair shearling, and Mr. Gillett was again in front with rams that have been winning about the country of late, but which could not have been so prominent here had the Cotswolds come out in anything like that force in which we have occasionally found them at the Royal Meetings. Amongst the Lincolns and other long-wools the old rams were clearly the best represented, there being nothing very particular amongst the shearlings or the ewes, where, as usual, Mr. Bumpstead Marshall was farming all the prizes. Considering the limited numbers to which they ran up, there was no sort of sheep showed

better than the Oxfordshire Downs, Mr. Bryan's shearlings being very near perfection in their way; the Duke of Marlborough's ewes as neat as pins, and Mr. Charles Howard's, if a little bigger, full of nice character and useful properties. In the old lot of rams Mr. Wallis had the preference with a couple that have been a deal about of late, as the first was first at Newcastle and the second first at the Bath and West of England a few weeks back. The latter, however, true to the type as he may be in other respects, shows too much of the Leicester about his head. It is noticeable, moreover, how white in the face some of the Southdowns are now becoming. Many of the leading flocks, as represented at Plymouth, appear to be gradually losing that beautiful grey tint once so characteristic of the breed, and with this much of that comeliness of countenance for which the Downs should be equally distinguished. In a very good class of shearlings Lord Walsingham still carried all before him, with great heavy fine-bodied sheep, the first and second being particularly good; and, as will be seen from the prize list, scarcely any other flock noticed amongst the many commendations. The Merton two-shear sheep were also remarkable for their fine growth and weight, though, as it struck us, Lord Walsingham's highly-commended ram was a truer type of the breed, of finer Southdown character than either the first or second prize-takers, if somewhat wanting in mere size and weight. Mr. Waters' third might also be deemed a little light, while his highly-commended four-shear is one of the few remaining Downs now about that was actually bred at Babraham. Mr. Rigden could make no headway, but his neighbour the Duke sent down a beautiful pen of ewes, as handsome as they can pick them out at Goodwood, and the true Southdown all over, if, as the critics would have it, a trifle light in their necks. They won all the way, against Lord Walsingham's useful seconds, and Lord Radnor's very pretty pen as a good third.

"If the following inherent attributes—viz., hardihood of constitution and adaptness to variety of soil or climate, beauty of symmetry and surpassing excellence of quality, size, muscle, and weight-making properties, natural productiveness and early maturity, aptitude to fatten and comparative lightness of offal, combined with the production of a heavy fleece of wool, of the best quality and staple—are calculated to realize the hopes and supply the wants of the breeder, then the true-bred Shropshire sheep stand pre-eminent amongst the foremost of England's breeds, and its sterling value and superiority will continue to be universally acknowledged." So says Mr. Preece, in a neat little commentary on his list of sales for the season; though we may add that this high character was scarcely corroborated at Plymouth. The judges were longer over the Shropshires than any other trio at work; and it was with some difficulty that we could place even the prize shearing on our latest telegram. The reason offered for this delay was the number of middling sheep in the class, and the comparative difficulty of selecting a really orthodox model. Certainly a man with a fancy might have gone any way he chose, for the Shropshires appear to be further from uniformity than ever, and one sheep is continually correcting the points of another. The first prize, after a deal of consideration, went to a smart, compact sheep of Mr. Mansell's, that came into the ring very lame, but which Professor Simonds at once passed as only suffering from a sprain. This ram is by the well-known Maccaroni, and the Adcott flock stood in again for third, with a clever, active sheep by the same sire. Beyond the other exhibitors whose entries were noticed by the judges there were many breeders of repute in the catalogue; but, as we have already intimated, the sample was not so good as it has been. Colonel Dyott's wide and straight two-shear has never previously been out, and Mr. Thornton's second,

as true a specimen of the Shropshire as anything in the section, was not at Newcastle, where, it will be remembered, this flock made its mark. The third prize, Young Quality, was first at Hereford, when we spoke of him as "wearing wonderfully well, as at four years old he is still active on his legs, though furnished into a great heavy sheep." Mr. Pryce-Bowen took a high commendation in this class, and should certainly have had another for his pen of ewes, which gave strong evidence of careful breeding in their uniform appearance, but the Messrs. Cranes' prize pen were full of quality, and Lady Willoughby de Broke's still asserting the progress her ladyship is making in the nice art of establishing a first-rate flock. The Hampshire Down ewes were very commendable for size and use; and there was one ewe, in the second-prize pen if we recollect aright, that was quite a marvel of excellence; though the rams, as usual, are great coarse animals with the most unpardonable heads, which it would be really a patriotic act to improve upon. It will be remembered that at Hereford we took the liberty of expressing this opinion in much the same terms, when we were at once taken to task by Mr. Randell; mainly, as it would appear, on his own showing, from his not being a breeder of this sort of sheep, and thus probably knowing little more of their actual merits or demerits than any other man. We may add, however, that we received many an assurance at Plymouth as to the tenor of our remarks being well warranted; as we may say further, that we shall still venture to speak out when we find occasion to do so, whatever Mr. Randell may urge to the contrary. There were a few good Somerset and Dorset horned sheep, some fewer still South Hams, reaching to five entries for six prizes, and a sprinkling of Exmoor and Dartmoor curiosities in the wool. These local breeds, however, were pretty generally a failure; and Mr. Sturgeon's couple of Merinos, exhibited as extra stock, did not get any mark of merit from the judges. It would be wrong to conclude our notice of the sheep show without mention of the great objection made by the judges in some of the classes to the practice of certain exhibitors insisting on every one of their sheep being led out by their own men. There are some shepherds as well known as Cuddy himself, who, as we hear, has retired on his laurels, and, of course, the repeated appearance of John This or Will That proclaims the ownership of a sheep as palpably as if the judges read the name from a catalogue. We would suggest for the future, if a sufficient staff of servants be not retained by the Society, that the Leicester shepherds should bring out the Downs, the short-wool men the long-wools, and so on; or, otherwise, hand the judges the complete catalogue at starting. Even further, where there were no rings, we occasionally noticed an exhibitor intruding his presence most unwarrantably, and standing side by side with the judges when they were handling the sheep! If no steward be present, the judges themselves should act in such a case, and at once warn off the offender.

But the great offenders, the real black sheep of the show, were to be dragged forth from amongst the pigs where two exhibitors, the one from the North and the other from the East, were disqualified over and over again, from having entered their pigs as younger than their actual age was found to be. This is an old story by now in the chronicles of the Society, as a mere disqualification is of itself an absurdity. Here at Plymouth you saw one number *disqualified*, the next taking a prize, and the third commended, all the pigs being the property of the same man, and the disqualified the first lot marked *sold*. Either let the penalty be that a person discovered a second time at these tricks be never permitted to exhibit again, or when the same owner has two disqualified lots at the same meeting let every pig in his name, or in which he is known to have any interest, be at once removed from the show ground. Amongst the swine the West

Country made a much better fight of it than elsewhere; for they have a very good kind of black pig, evidently grafted on the Essex, as their Berkshires look occasionally to have a dash of the same blood. On the other hand, the sort mostly out of their element here were the large Yorkshires, regarded chiefly as curiosities, and the least selling of anything in a very brisk market. Mr. Duckering, in fact, rather clouded his rising repute by exhibiting in the local lots a terrible monster of a boar, whose long snout alone should have been deemed sufficient to condemn him. The middle-class sort, a nondescript breed chiefly from the big pigs, were not much more in demand, and the merit of the show rested with the small whites, the small blacks, and the Berkshires. Mr. Dickinson's small white boar, a long way the best of his class, is as level a pig as ever was seen, and with three or four disqualifications he had, beyond Mr. Stearn's entry, no actual competition to encounter. In the companion class of blacks Mr. Stearn got to his old place, but the judges quite overlooked some very good entries made by Sir Massey Lopes, Mr. Mortimer Ford, and other Devon men. This oversight was the more noticeable in the capital class of small black sows, where the Devonshires were still passed over; mainly, as it would seem, for their not being oiled and coloured up to the show-pitch; and so Mr. Stearn claimed first again with a very nice active sow of her sort. The judging thus far had not been very satisfactory, but the Berkshires were a deal too strong for the authorities, who upset all the previous placing elsewhere, and took quite a line of their own, without much argument for the eccentric course they adopted. In the boars they put Mr. Stewart above Mr. Yells, whereas the late Hereford award was all the other way; and in the sows they highly commended Mr. Stewart's best, as clever an animal as ever was bred, awarded their first prize to a very fair one from the same piggery, and their second to a small poor sow also the property of Mr. Stewart. Then they altogether missed Mr. Allender's famous sows that have been winning continually, but duly commended others that the Winslows have beaten over and over again! In the lots of three, Suffolk had the best of the blacks and whites; and Mr. Yells and Mr. King Tombs, whose breeds are identical, the call of the Berkshires, with some very nice and sorty young pigs. Scattered through the other classes, Mr. Gamon and Mr. Duckering made some entries that were both winning and selling, a satisfactory proof of their worth that should be recorded to the credit of the judges, who, however, had altogether rather a rough time of it, if they heard a tithe of the commentary their decisions created. In truth, what with the disqualifications and other little mistakes, the "sensation" of the show centred on the swine.

The general arrangements, so far as the stock show went, were very good, and the ground itself on a beautiful bit of breezy upland, offered a fine view of the Sound and the town. Then the Royal visit gave a spirit to the meeting which was very much needed; for we never remember any head-quarters where so much fitness prevailed as in Plymouth during the show week. There was, certainly, a dinner on the Tuesday, with Sir Edward Kerrison in the chair, but very little came of it, and as the Mayor kindly fired an entertainment of his own for the same evening, everybody that possibly could carefully kept away from the more public gathering. The Prince and Princess, as usual, were terribly mobbed during their round of the show, and it was a positive relief to watch the royal pair as they quietly steamed through the shipping a few hours afterwards, free at last of that obtrusive loyalty which expresses itself in an utter defiance of all the laws of politeness and decorum. No wonder that crowned heads will occasionally command private views.

## PRIZE LIST.

### CATTLE.

#### SHORTHORNS.

JUDGES.—G. Drewry, Holker, Newton-in-Cartmel.  
J. Robinson, Clifton Pastures, Newport Pagnell.  
J. B. Thompson, Anlaby, Hull.

Bulls above three and not exceeding six years old.—First prize, £25, R. Sharpe, Courlands, East Grinstead (Lord Chancellor). Second of £15, E. Bolitho, Trewidden, Penzance (Favourite). Third of £5, A. Coryton, Fentille Castle, Saltash (Holwood).

Bulls above two and not exceeding three years old.—First prize, £25, J. S. Ford, Luson, Holbourn, Ivy Bridge (Duke of Devonshire). Second of £15, J. Charlesworth, Headfield, Dewsbury, Yorks (Baron Blencow). Third of £5, J. Claydon, Littlebury, Saffron Walden (Knight of North Essex).

Bulls above one and not exceeding two years old.—First prize, £25, F. H. Fawkes, Farnley Hall, Odley (Friar Tuck). Second of £15, T. C. Booth, Warlsby, Northallerton (Commander in Chief). Third of £5, Z. Walker, Birmingham (Battersea First Fruits). Highly commended: Lord Walsingham, Merton Hall, Thetford (Lord Lovell 2nd). Commended: J. Bulteel, Pamflete, Ivybridge (Forester).

Bull-calves above six and not exceeding twelve months old.—First prize, £10, F. H. Fawkes (Friar Bacon). Second of £5, Sir Anthony de Rothschild, Bart., Aston Clinton, Tring (Corporal). Highly commended: G. Garne, Churchill Heath, Chipping Norton (Plymouth Candidate).

Cows above three years old.—First prize, £20, J. Wood, Stanwick Park, Darlington (Oorinne). Second of £10, R. Stratton, Walls Court, Bristol (Diadem). Third of £5, R. Sharpe (Elegant). Highly commended: Lady Pigot, Branches Park, Newmarket (Perfume). Commended: R. Stratton (Maid of Honour); W. Hoaken and Son, Loggans Mill, Hayle, Cornwall (Moas Rose), and R. Tennant, Scarcroft Lodge, Leeds (Frederick's Farewell).

Heifers, in-milk or in-calf, not exceeding three years old.—First prize, £15, T. C. Booth (Lady Fragrant). Second of £10, J. Logan, Maindies House, Newport, Monmouth (Charlotte 4th). Third of £5, Lady Pigot (Lady of Rosales). Highly commended: R. Stratton (Garland).

Yearling heifers.—First prize, £15, Lord Feversham, Duncombe Park, Helmsley (Princess). Second of £10, R. Tennant (Miss Farewell). Third of £5, J. Wood, Stanwick (Chlotilde). Highly commended: W. Hoaken and Son (Carnation), and Sir Anthony de Rothschild, Bart. (Isabella Graceful). Commended: Lady Pigot (Victoria Alba); Sir Anthony de Rothschild (Margaretta); C. Howard, Biddenham, Bedford (Fanny Gwynne); C. Howard (Lady Sarah Spencer), and E. Sharpe (English Emily).

Heifer calves above six and under twelve months old.—First prize, £10, T. E. Pawlett, Beeston, Sandy, Beds (Charm 8th). Second of £5, Sir Anthony de Rothschild, Bart. (Little Cherry). Highly commended: R. Stratton (Brilliant), and Boughton Kingdon, Rose Hill, Exeter (Joanica).

#### HEREFORDS.

JUDGES.—J. Druse, Eynaham, Oxon.

G. Pye, Madlay, Hereford.

W. Yeomans, Stretton Court, Hereford.

Bulls above three and not exceeding six years old.—First prize, £25, J. M. Read, Elkstone, Cheltenham (Peremptory). Second of £15, J. A. Hollings, The Hilland, Hereford (Chieftain 2nd). Third of £5, J. Baldwin, Luddington, Stratford-on-Avon (Battersea). Commended: J. M. Read (Oleoborne).

Bulls above two and not exceeding three years old.—First prize, £25, T. Duckham, Bayham Court, Ross (Commodore). Second of £15, W. Stallard, Brockhampton, Ross (Chieftain 3rd). Third of £5, J. M. Read (Sultan).

Bulls above one and not exceeding two years old.—First prize, £25, J. R. Paramore, Dinador Court, Hereford (Dinador). Second of £15, E. Wright, Halston Hall, Oswestry (Sir John). Third of £5, W. Tudge, Adforton, Leintwardine (Douglas). Highly commended: W. Stallard (Soothsayer).

Bull-calves above six and not exceeding twelve months old.—First prize, £10, J. Monkhouse, The Stow, Hereford (Grande). Second of £5, J. R. Paramore (Trueboy). Commended: H. R. Evans, junr., Swanstone Court, Dilwyn, Leominster (Lord Tamton).

Cows above three years old.—First prize, £20, J. Baldwin (Duchess of Bedford 2nd). Second of £10, J. Walker, Watfield House, Holmer, Hereford (Longwaist). Third of £5, J. Walker (Holmer Lass). Highly commended: T. Oliver, Penhallow, Grampound (Blissom).

Heifers, in-milk or in-calf, not exceeding three years old.—First prize, £15, J. Baldwin (Miss Hastings 2nd). Second of £10, G. Pitt, Chadnor Court, Dilwyn, Leominster. Third of £5, Major-General the Hon. A. Nelson Hood, Cumberland Lodge, Windsor (Crown Princess).

Yearling heifers.—First prize, £15, E. Wright (Marchioness). Second of £10, J. Monkhouse (Fairy Queen). Third of £5, P. Turner, The Lees, Pembridge, Leominster (Queen of the

**Vale.** *Highly commended:* P. Turner (Sybil), and J. H. Arkwright, Hampton Court, Leominster (Spot). *Commended:* Major-General the Hon. A. Nelson Hood (Jeannette); Major-General the Hon. A. Nelson Hood (Constance); J. Bartlett, Lifton, Devon (Lucky); J. H. Arkwright (Perfection); H. R. Evans, junr. (Worcester Lass), and J. M. Read (Aletta).  
*Heifer calves, above six and under twelve months old.*—First prize, £10, Major-General the Hon. A. Nelson Hood, (Princess Mary). Second of £5, J. Monkhouse (Josephine). *Commended:* J. Baldwin (Rose of Bedford); J. H. Arkwright (Hampton Beauty and another), and T. Duckham (Darling).

## DEVONS.

**JUDGES.**—E. L. Franklin, Ascott, Wallingford.  
 J. E. Jones, Springfield, Hereford.  
 S. Umbers, Wappenburg, Leamington.

*Bulls above three and not exceeding six years old.*—First prize, £25, J. Sobey, Trewolland, Liskeard (Sobieski). Second of £10, J. Davey, Flitton Barton, North Molton (Duke of Flitton 2nd). Third of £5, J. A. Smith, Bradford Peverell, Dorchester (Constitution). *Highly commended:* Lord Clinton, Beaton Tatchville, Beaton, Devon (Baronet). *The class commended.*

*Bulls above two and not exceeding three years old.*—First prize, £25, Viscount Falmouth, Tregethman, Probus (Sunder). Second of £15, J. H. Buller, Downes, Crediton. Third of £5, W. Farthing, Stowey Court, Bridgewater (Osborn).

*Bulls above one and not exceeding two years old.*—First prize, £25, G. Turner, Beacon Downs, Exeter (Banning). Second of £15, G. Turner (Magnum Bonum). Third of £5, J. Bodley, Stockley Pomeroy, Crediton (Lincoln). *Highly commended:* J. A. Smith (Hercules). *The class commended.*

*Bull-calves above six and not exceeding twelve months old.*—First prize, £10, W. Taylor, Harptree Court, Blagdon (Profit's Duke). Second of £5, W. Farthing. *Highly commended:* J. Davy (Duke of Flitton 3rd). *Commended:* J. W. Dingle, Darley, Callington (Darley Boy).

*Cows above three years old.*—First prize, £30, J. Davy (Empress). Second of £10, W. Taylor (Beauty). Third of £5, J. Quarterly, Champion Mollard, Southmolton (Stately). *Highly commended:* J. Quarterly (Handsome). *The class commended.*

*Heifers, in-milk or in-calf, not exceeding three years old.*—First prize, £15, Major-General the Hon. A. Nelson Hood (Rose of Denmark). Second of £10, J. Quarterly. Third of £5, J. Davy (Lady Bess). *Commended:* T. Palmer, Norton, Stoke Climsland, Lameconton (Graceful).

*Yearling heifers.*—First prize, £15, J. Davy (Symmetry). Second of £10, J. Quarterly. Third of £5, J. Davy (Young Cherry). *Highly commended:* G. Turner (Lady Evelyn). *The class commended.*

*Heifer calves, above six and under twelve months old.*—First prize, £10, W. Farthing. Second of £5, J. A. Smith (Picture). *Highly commended:* W. Taylor (Curly's Duchess). *The class commended.*

## SUSSEX.

**JUDGES.**—J. Druce, Eynham, Oxon.  
 G. Pye, Madlay, Hereford.  
 W. Yeomans, Stretton Court, Hereford.

*Bulls above one and not exceeding six years old.*—First prize, £15, J. and A. Heasman, Angmering, Arundel (The Duke).

*Cows above three years old.*—First prize, £15, J. and A. Heasman (Battersea). Second of £10, J. and A. Heasman (Lily). *Highly commended:* G. Jenner, Parsonage House, Camore (Full-pail).

*Heifers, in-milk or in-calf, not exceeding three years old.*—First prize, £15, J. and A. Heasman (Plymouth). Second of £10, Thidien Smith, Knell Farm, Beckley, Staplehurst (Betty). *Commended:* G. Jenner (Belmes).

*Yearling heifers.*—First prize, £15, J. and A. Heasman. Second of £10, J. and A. Heasman. *Highly commended:* G. Jenner (Beauty).

## CHANNEL ISLANDS.

**JUDGES.**—J. Dumbrell, Ditchling, Hursperpoint.  
 M. Gibaut, Mainland, Jersey.  
 C. P. Le Cornu, Trinity Manor, Jersey.

*Bulls above two and not exceeding six years old.*—First prize, £20, A. Le Gallais, La Moie House, St. Aubin, Jersey (Butterfly). Second of £10, C. Pallot, St. Saviour's, Jersey (The Prince). Third of £5, G. Foots, Aabbarton House, St. Andrews (Conqueror).

*Bulls above one and not exceeding two years old.*—First prize, £20, C. Pallot. Second of £10, C. Robin, Mon Plaisir, St. Peter's Port, Guernsey (Prince of Wales). Third of £5, H. Le Feuvre, Les Nègres, St. Peter's, Jersey (Duke).

*Cows above three years old.*—First prize, £20, F. Browning, La Pairmoine, St. Lawrence, Jersey (Betsey). Second of £10, P. Gandin, St. Martin's, Maunfat, St. Helier's, Jersey (Jolie). Third of £10, H. de Jersey, Le Lacquer, Morges, St. Andrews, Guernsey (Mary). *Highly commended:* W. Alexandre, St. Owen's, Jersey (Griseotte); A. Le Gallais

(Cherry); D. Goodland, Haviland, St. Peter's Port, Guernsey (Fawn). *Commended:* T. Blondel Le Page, Maison-le-bas, St. Andrews, Guernsey (Guernsey Lady).

*Heifers in-milk or in-calf, not exceeding three years old.*—First prize, £20, Eli Nicolle, La Fontaine, Trinity, Jersey (Brown). Second of £10, H. Le Feuvre (Cowallip). Third of £5, P. Gandin (Petite Jolie). *Highly commended:* H. Le Feuvre (Matchless); A. Le Gallais (Star). *Commended:* A. Le Gallais (Rose); R. Rendle, Catal Farm, Guernsey (Lady Jane); R. Rendle (Matty).

## OTHER ESTABLISHED BREEDS.

**JUDGES.**—J. Druce, Eynham, Oxon.  
 G. Pye, Madlay, Hereford.  
 W. Yeomans, Stretton Court, Hereford.

*Bulls above two and not exceeding six years old.*—First prize, £15, R. H. Chapman, Upton, Nunneaton (Longhorn, Old Sparkenhoe). Second of £10, Sir E. Kerrison, Bart., Brome Hall, Soole (Suffolk Polled, Eclipse).

*Bulls above one and not exceeding two years old.*—First prize, £15, Sir E. Kerrison (Suffolk, Hero).

*Cows above three years old.*—First prize, £15, Sir Kerrison (Norfolk, Violet). Second of £10, Sir E. Kerrison (Suffolk, Susanna).

*Heifers in-milk or in-calf, not exceeding three years old.*—First prize, £15, R. H. Chapman (Longhorn, Brindled Beauty).

*Yearling Heifers.*—First prize, £15, Sir E. Kerrison (Suffolk, Susan). Second of £10, Sir E. Kerrison (Suffolk, Belle).

## HORSES.

## THOROUGH-BRED.

**JUDGES.**—C. Barnett, Stratton Park, Biggleswade.  
 Thomas Farrington, Normanby, Middlebro'.  
 W. Young, Field House, Hull.

*Thorough-bred Stud Horses best calculated to improve and perpetuate the breed of the sound and stout Thorough-bred Horse for General Stud Purposes.*—First prize, £100, J. Casson, Middleton Lodge, Uphall, Linlithgowshire (Motley). Second of £25—no competitors.

## HUNTERS.

**JUDGES** as for Thorough-breds.

*Thorough-bred Stallions, suitable for getting Hunters, whose regular charge for serving Half-bred Mares during the season 1886 has not exceeded Five Guineas.*—First prize, £50, E. G. Laxton, Brushfield, Wembworthy (Bald-headed Stag). Second of £20, J. Tremayne, Sydenham House, Lew Down, Devon (Paul Clifford). Third prize—no merit.

*Mares, with Foals at foot or in-calf, for breeding Hunters.*—First prize, £20, W. Barrett, Puddaven, Totnes (Kitty). Second of £15, the Rev. J. L. Brereton, West Buckland, Southmolton, Devon (The Countess). Third of £5, E. H. Watson, Dorley, Totnes (The Banker's Pet).

## HACKNEYS.

**JUDGES** as for Thorough-breds.

*Mares, with Foals at foot or in-calf, for breeding Hackneys.*—First prize, £20, C. Trevelyan, Plymouth (Wren). Second of £10, E. H. Watson (Brideamaid). Third of £5, C. Frankin, Bicken Hall, Taunton (Useful).

## PONIES.

**JUDGES** as for Thorough-breds.

*Stallions not exceeding fourteen hands.*—First prize, £15, C. A. Moorehead, Witney Court, Plymouth (Sultan). Second of £10, E. Maund, Heaselly Mill, Northmolton (Young Bobby). Third—no sufficient merit.

*Mares not exceeding fourteen hands.*—First prize, £10, S. Sampson, Park, Broadwoodkelly, Winkleigh, Devon (Alice Bray). Second of £5, J. H. Trehan, Stockton, Callington (Princess).

## AGRICULTURAL HORSES.

(Not qualified to compete as Suffolk.)

**JUDGES.**—T. Brooks, Croxby, Caistor.  
 G. K. Cooper, Euston, Thetford, Norfolk.  
 James Steadman, Bognall, Edinburgh.

*Stallions foaled before 1st January, 1883.*—First prize £25, The Duke of Beaufort, Badminton, Chippenham (Sir Robert). Second of £15, Rev. S. Terry, Dummer, Basingstoke (Waverley). Third of £10, W. Epiphick, Cricksea Lodge, Burnham, Essex (Boxer). *Commended:* R. Jacob, Bottensborough, Glastonbury (Orford).

*Stallions foaled in the year 1883.*—First prize, £20, W. Walker, Colne, St. Ives (Young Conqueror). Second of £10, J. Oram, Shellingford, Faringdon (King of the Vale). Third of £5, H. Hitchcock, Chitteries Allmains, Heytesbury (Albert). *Commended:* The Duke of Richmond, Goodwood, Chichester (Lord Francis 1st).

*Mares and Foals.*—First prize, £20, J. Snee Buit, Dodhill House, Kingston, Taunton (Brown). Second of £10, J. Logan, Maindee, Newport (Stout). Third of £5, G. Elliot, Swiley Farm, Plymouth (Blossom).

Three-year-old Mares.—First prize, £15, J. Slee Bult, (Beasy). *No further entry.*

Two-year-old Fillies.—First prize, £15, Major-Gen. the Hon. A. Nelson Hood (Rose). Second of £10, G. Elliott (Alma).

#### SUFFOLKS.

JUDGES.—As for Agricultural Horses.

Stallions foaled before the 1st January, 1863.—First prize, £30, Sir E. Kerrison, Bart. Second of £10, A. Hughes, Thorness, Isle of Wight (Carisbrooke). *Commended:* C. Boby, Alton Hall, Stutton, Ipswich (Conqueror).

Stallions foaled in the year 1863.—First prize, £15, W. H. Walker, Wennington, Romford (Hero). Second of £10, W. Taylor, Harptree Court (Rob Roy).

Mares and Foals.—First prize, £20, Sir E. Kerrison (Lady Jane). Second of £10, Rev. F. Sandys Wall, Bradley Wood, Newton Abbot (Thoughty).

Two-year-old Fillies.—First prize, £15, Sir E. Kerrison (Worcester Diamond). Second of £10, S. Clayden, Linton (Baby).

#### SHEEP.

##### LEICESTERS.

JUDGES.—L. Borman, Irby, Caistor, Lincolnshire.  
J. Painter, Mount Vernon Villa, Nottingham.  
T. Twichell, Willington, Bedford.

Shearling Rams.—First prize, £20, J. Borton, Barton House, Malton. Second of £10, A. Dabbs, Seckington, Tamworth. Third of £5, Col. W. Inge, Thorp Constantine, Tamworth. *Highly commended:* J. Borton. *Commended:* J. Gould, Poltimore, Exeter; E. W. Creswell, Ravenstone, Ashby-de-la-Zouch; T. Stamper, Highfield House, Oswaldkirk.

Rams of any other age.—First prize, £20, R. W. Creswell. Second of £10, J. Borton. Third of £5, E. W. Creswell. *Highly commended:* J. Borton. *Commended:* S. Kingdon, Lynch, Thorverton, Devon, and J. Borton.

Pens of Five Shearling Ewes of the same flock.—First prize, £15, T. Stamper. Second of £10, J. Borton. Third of £5, Col. Wm. Inge. *Commended:* J. Gould.

##### COTSWOLDS.

JUDGES.—H. Aylmer, West Dereham Abbey, Stoke Ferry.  
H. Bateman, Witney.  
C. Clarke, Scopwick, Sleaford.

Shearling Rams.—First prize, £20, T. Walker, Stowell Park, Northleach. Second of £10, J. Gillett, Fawler, Charlbury. Third of £5, J. Gillett.

Rams of any other age.—First prize, £20, J. Gillett. Second of £10, T. B. Browne, Salperton Park, Andoversford. Third of £5, J. Gillett.

Pens of Five Shearling Ewes of the same flock.—First prize, £15, T. B. Browne. Second of £10, J. Wells, Hampnett, Northleach. Third of £5, J. Wells.

##### LINCOLNS AND OTHER LONG-WOOLS.

(Not qualified to compete as Leicesters or Cotswolds.)

JUDGES.—As for Cotswolds.

Shearling Rams.—First prize, £20, T. B. Marshall, Bransdon, Lincoln. Second of £10, T. B. Marshall. Third of £5, J. Lynn, Church Farm, Stroxtan, Grantham.

Rams of any other age.—First prize, £20, J. Lynn. Second of £10, T. B. Marshall. Third of £5, T. B. Marshall. *The class commended.*

Pens of Five Shearling Ewes of the same flock.—First prize, £15, T. B. Marshall. Second of £10, Rev. J. Ll. Brereton. Third prize: *No competition.*

##### OXFORDSHIRE DOWNS.

JUDGES.—E. Gough, Gravel Hill, Shrewsbury.  
T. Horley, jun., The Fosse, Leamington.  
R. J. Newton, Campfield Farm, Woodstock.

Shearling Rams.—First prize, £20, J. Bryan, Southleigh, Witney. Second of £10, J. Bryan. Third of £5, J. Bryan. *Highly commended:* J. Bryan. *Commended:* G. Wallis, Old Shifford, Bampton, and J. Bryan.

Rams of any other age.—First prize, £20, G. Wallis. Second of £10, G. Wallis. Third of £5, C. Howard, Biddenham.

Pens of Five Shearling Ewes of the same flock.—First prize, £15, Duke of Marlborough, Blenheim Palace, Woodstock. Second of £10, C. Howard. Third of £5, C. Howard.

##### SOUTHDOWNS.

JUDGES.—H. Fookes, Whitechurch, Blandford.  
H. Overman, Wessensham, Rougham, Norfolk.  
J. S. Turner, Chyngton, Seaford.

Shearling Rams.—First prize, £20, Lord Walsingham, Merton Hall, Thetford. Second of £10, Lord Walsingham. Third of £5, Lord Walsingham. *Highly commended:* The Duke of Richmond, Goodwood, Chichester. *Commended:* Lord Walsingham (for three other rams), and J. J. Farquharson, Langton House, Blandford.

Rams of any other age.—First prize, £20, Lord Walsingham. Second of £10, Lord Walsingham. Third of £5, J. Waters, Motcomb, Eastbourne. *Highly commended:* Lord Walsingham, and J. Waters. *Commended:* Sir T. B. Lennard, Bart., Belhus Avely, Romford, and W. Rigden, Hove, Brighton.

Pens of Five Shearling Ewes of the same flock.—First prize, £15, the Duke of Richmond. Second of £10, Lord Walsingham. Third of £5, the Earl of Radnor, Colehill, Highworth. *Highly commended:* The Duke of Richmond.

##### SHROPSHIRE.

JUDGES.—As for Oxfordshire Downs.

Shearling Rams.—First prize, £20, T. Mansell, Adcot Hall, Shrewsbury (Mansion). Second of £10, J. and E. Crane, Shrawardine, Shrewsbury. Third of £5, T. Mansell. *Highly commended:* J. and E. Crane, and Lady Willoughby de Broke, Compton Verney, Warwick. *Commended:* H. J. Sheldon, Brailes House, Shipston-on-Stour.

Rams of any other age.—First prize, £20, Col. B. Dym, Freeford, Lichfield (Beaufort). Second of £10, E. Thornton, Pitchford, Shrewsbury (Pitchford Volunteer). Third of £5, Sampson Byrd, The Leese, Stafford (Young Quality). *Highly commended:* P. W. Bowden, Shrawardine Castle, Shrewsbury (Lord Clifden). *Commended:* Lord Wenlock, Bourton Cottage, Much Wenlock (Worcester).

Pens of Five Shearling Ewes of the same flock.—First prize, £15, J. and E. Crane. Second of £10, E. Holland, Dumbleton Hall, Evesham. Third of £5, Lady Willoughby de Broke.

##### HAMPSHIRE AND OTHER SHORT-WOOLS.

(Not qualified to compete as Southdowns or Shropshires).

JUDGES.—As for Southdowns.

Shearling Rams.—First prize, £20, J. Rawlence, Bulbridge, Wilton, Salisbury (Berwick). Second of £10, M. Arnold, Westmeon, Petersfield. Third of £5, J. Rawlence (The Duke). *Highly commended:* M. Arnold (Brown Ben).

Rams of any other age.—First prize, £20, J. Rawlence (Catchem Alive). Second of £10, M. Arnold. Third of £5, S. King, Bockhampton Farm, Lambourne. *Highly commended:* W. B. Canning, Elston, Devizes; J. Rawlence.

Pens of Five Shearling Ewes of the same flock.—First prize, £15, J. Rawlence. Second of £10, J. Rawlence. Third of £5, W. B. Canning. *Highly commended:* J. Lawrence. *Commended:* W. F. Bennett, Chilmark, Salisbury.

##### SOMERSET AND DORSET HORNED.

JUDGES.—P. Halse, Moland, South Molton.  
J. Hole, Knowle House, Dunster.  
E. Pope, Great Toller, Maiden Newton.

Shearling Rams.—First prize, £15, T. Danger, Huntstile, Bridgwater. Second of £5, A. J. Pitfield, Eype, Bridport. Rams of any other age.—First prize, £15, A. J. Pitfield. Second of £5, A. J. Pitfield.

Pens of Five Ewes of any age, of the same flock.—First prize, £10, T. Danger. Second of £5, A. J. Pitfield.

##### SOUTH HAMS.

JUDGES.—As for Somerset and Dorset Horned.

Shearling Rams.—First prize, £15, J. Willocks, Cleve, Ivybridge.

Rams of any other age.—First prize, £15, G. Dewdney, Baccamoor, Plympton.

Pens of Five Ewes of any age, of the same flock.—First prize, £10, J. Willock. Second of £5, R. C. Clark, Butthead, St. Budeaux, Plymouth.

##### DARTMOORS (IN WOOL).

Shearling Rams.—First prize, £15, J. Drew, Artiacombe, Tavistock. Second of £5, R. May, Grendon, Tavistock.

Rams of any other age.—First prize, £15, R. May. Second of £5, T. Squire, North Brenton, Lamerton.

Pens of Five Ewes, of any age of the same flock.—First prize, £10, J. Drew. Second of £5, J. March, Widwell, Tamerton Foliot, Plymouth. *Commended:* T. Munford, Purp Strangh Prior, Plympton.

##### EXMOORS (IN WOOL).

Shearling Rams.—First prize, £15, E. Maunder, Heasleby Mill, North Molton. Second of £5, J. Passmore, Fyldon, North Molton.

Rams of any other age.—First prize, £15, E. Maunder. Second of £5, W. Taylor, Harptree.

Pens of Five Ewes of any age, of the same flock.—First prize, £10, W. Taylor. Second of £5, J. Passmore.

##### P I G S.

JUDGES.—S. Druce, Kynaham, Oxon.

E. P. Squarey, Oldstock, Salisbury.  
T. Trotter, Bywell, Stooksfield-on-Tyne.

Boars of a large white breed.—First prize, £10, W. B. Wain man, Carisbad, Cross Hills, Yorkshire. Second of £5, B. Dickinson, Old Road, Stockport.

Boars of a small white breed.—First prize, £10, R. Dickinson. Second of £5, S. G. Stearn, Brandeston, Wickham Market.

Boars of a small black breed.—First prize, £10, S. G. Stearn. Second of £5, G. M. Sexton, Wheatstead Hall, Ipswich.

Boars of the Berkshire breed.—First prize, £10, A. Stewart Saint Bridge House, Gloucester. Second of £5, W. Yells Round Robin Farm, Highworth.



Boars of a breed not eligible for the preceding classes.—First prize, £10, R. E. Duckering, Northorpe, Kirtton Lindsay, Lincoln. Second of £5, W. B. Wainman.

Breeding Sows of a large white breed.—First prize, £10, W. Gamon, The Green, Thornton-le-Moor, Chester. Second of £5, R. E. Duckering.

Breeding Sows of a small white breed.—First prize, £10, J. Buteak, Pamflete, Ivybridge. Second of £5, G. M. Sexton. *Highly commended*: S. G. Stearn.

Breeding Sows of a small black breed.—First prize, £10, S. G. Stearn. Second of £5, G. M. Sexton. *Highly commended*: G. M. Sexton. *Commended*: W. F. Collier, Woodtown, Horrabridge, Devon (for two sows).

Breeding Sows of the Berkshire breed.—First prize, £10, A. Stewart. Second of £5, A. Stewart. *Highly commended*: A. Stewart. *Commended*: W. Hower, Sevenhampton, Highworth (for two sows).

Breeding Sows not eligible for the preceding classes.—First prize, £10, R. E. Duckering. Second, W. Gamon. *Commended*: W. B. Wainman.

Three Breeding Sow Pigs of a large white breed, of the same litter, above 4 and under 6 months old.—First prize, £10, R. E. Duckering. Second of £5, W. B. Wainman.

Three Breeding Sow Pigs of a small white breed, of the same litter, above 4 and under 8 months old.—First prize, £10, S. G. Stearn. Second of £5, G. M. Sexton.

Three Breeding Sow Pigs of a small black breed, of the same litter, above 4 and under 8 months old.—First prize, £10, G. M. Sexton. Second of £5, G. M. Sexton.

Three Breeding Sow Pigs of the Berkshire breed, of the same litter, above 4 and under 8 months old.—First prize, £10, W. Yells. Second of £5, J. K. Tombs.

Three Breeding Sow Pigs, of a breed not eligible for the preceding classes, of the same litter, above 4 and under 8 months old.—First prize, £10, G. Mangles, Givendale, Ripon. Second of £5, W. Bradley Wainman.

#### PRIZES OFFERED BY THE LOCAL COMMITTEE OF DEVONPORT AND PLYMOUTH.

##### DEVONS.

Bulls, Cows, and Offspring; the latter not to exceed 9 months old on the 1st of July, 1885, the Cows to have been bred for the property of the exhibitors two years previously to the 1st July, 1885.—First prize, £30, W. Farthing (Viscount, Jenny, and Young Jenny). Second, £15, S. Pridham, Pool Farm, Cheriton, Devon (Young Champion, Chance, and Monarch).

Pairs of Cows, in-milk or in-calf, exceeding 3 years 6 months old.—First prize, £20, W. Taylor (Lovely and Vandine). Second, £10, W. Farthing (Pink and Petherton). *Commended*: J. Tremain, Trevarthian (Rose and Favourite).

Pairs of Heifers, in-milk, or in-calf, not exceeding 3 years 6 months old.—First prize, £20, J. Bodley, Stockley Pomeroy, Crediton (Gentle Annie and Gay Lass). Second, J. A. Smith (Honest and Yellowbat).

Pairs of Heifers not exceeding 2 years 6 months old.—First prize, £15, to Viscount Falmouth, Tregethnan (Lily Bell and Bonny Lass). Second, £8, G. Turner (Hilda and Violet).

Pairs of Heifers not exceeding 1 year 6 months old.—First prize, £15, W. Taylor (Sir William's Peggy and Salisbury's Lovely). Second, £9, J. Bodley (Violet and Famous).

Pairs of Bull-Calves not exceeding 9 months old.—First prize, £20, G. Turner. Second, £10, J. Bodley (Earl of Edon and Volunteer).

##### SOUTH HAMS CATTLE.

Bulls exceeding 3 and not exceeding 5 years.—First prize, £15, G. Dewdney, Baccamoor, Plympton (Hero). Second, £10, T. R. Cornish, Wolfgrove Farm, Bishopsteignton, Teignmouth (Crocchet 2nd).

Bulls exceeding 1 and not exceeding 3 years old.—First prize, £15, W. Coaker, Charleton Court, Kingsbridge, Devon (Admiral). Second, £10, G. Dewdney (Nelson).

Cows in-calf, or in-milk, exceeding 4 years old.—First prize, £10, W. Coaker (Cheerful). Second, £5, R. Sowton, Yealmp-ton, Devon (Starhead).

Heifers in-calf, or in-milk, not exceeding 4 years old.—First prize, £10, J. Anthony, Yealmp-ton, Devon (Maid of the Mill). Second, £5, G. Coaker (Young Beauty).

Heifers not exceeding 1 year and 6 months old.—First prize, £8, W. Adams, Centry, Kingsbridge, Devon. Second, £3, E. Ford, Abbotkirkwell, Newton Abbot (Cherry).

##### AGRICULTURAL HORSES.

Stallions not exceeding 8 years old.—First prize, £15, J. Henderson, Horsley Hill, South Shields, Durham (Victor). Second, £10, E. Shinner, jun., Stretchford, Staverton, Totnes, Devon (Young Nelson). *Commended*: W. Jackman, Bawcombe, Bradstone, Tavistock (Young Matchless).

Mares or Fillies not exceeding 7 years old.—First prize, £10, J. Anthony (Bessie). Second, £5, J. Logan.

##### HUNTERS.

Mares or Geldings 4 years old.—First prize, £15, G. B. Bettams (Millo). Second, £10, G. B. Bettams (Sultan). *Highly Commended*: The Rev. A. C. Thynne, Peastowe, Stratton, Cornwall (Warwick).

Mares or geldings 5 and not exceeding 6 years old.—First prize, £15, G. B. Bettams (Milloford).

##### ROADSTERS.

Mares or Geldings 5 or 6 years old, not less than 14 nor exceeding 16 hands 1 inch.—First prize, £10, T. Palmer, Borough, Kelly, Tavistock. Second, £5, Rev. J. L. Brereton, West Buckland.

##### DARTMOOR PONIES.

Stallions not exceeding 13½ hands.—First prize, £10, T. K. Bickell, Corn Market Inn, Tavistock (Little Wonder). Second, £5, W. Griffin, Lamerton, Tavistock (Kohinoor).

##### EXMOOR PONIES.

Stallions not exceeding 13½ hands.—First prize, £10, J. Abraham, Villa, Bude Haven, Cornwall (Bagatelle). Second, £5, C. Willeford, Tavy Cottage, Tavistock (Prince).

Mares not exceeding 13 hands.—First prize, £10, H. B. Hambling, Doddbrook, Kingsbridge (Sally). Second, £5, W. Salter, North Tawton, Barton, Devon (Mulum in Farvo).

##### PIGS.

Boars, Sows, and Litters of a large breed, bred by exhibitors, the litters not to exceed 12 weeks old on the 17th July, 1885.—First prize, £10, R. E. Duckering.

Boars, Sows, and Litters, of a small black breed, bred by the exhibitors, the litters not to exceed 12 weeks old on the 17th July, 1885.—First prize, £10, S. G. Stearn. Second, £5, G. M. Sexton.

##### BUTTER.

JUDGES.—T. Litton, 12, Newgate-street, London, E.C. Twelve Pounds of Scald Cream Butter, made and printed in Pounds and Half-pounds.—First prize, £5, J. Widdcombe, Torrhill, Ivybridge. Second, £3, T. Burnaford, Tamerton Foliot, Plymouth. *Highly Commended*: W. F. Collier, Woodtown, Horrabridge, Devon.

##### WOOL.

JUDGES.—T. Clayton, Stanley House, Ripley, Yorks. J. Gurney, Hownslow, W. Leicester.—Prize, £3, T. Harris, Stony Lane House, Bromsgrove. Southdown.—Prize, £3, C. Boby, Alton Hall, Sutton, Ipswich.

Shropshire.—Prize, £3, D. R. Davies, Mere Old Hall, Knutsford. Hampshire and other Short-Wools.—Prize, £3, C. Howard, Biddenham, Bedford.

Dartmoor.—Prize, £3, R. May, Grandon, Tavistock. Exmoor.—Prize, £3, E. Maunders, Heasely Mill, North-molton.

##### STEWARDS OF STOCK.

Mr. Dent, Ribston Hall, Wetherby (Horses). Mr. Randell, Chadbury, Evesham (Cattle). Mr. Bowly, Siddington House, Cirencester (Sheep and Pigs).

##### VETERINARY INSPECTORS.

Professor Simonds, Royal Veterinary College (Cattle, Sheep, and Pigs). Professor Varnell, Royal Veterinary College (Horses).

ASSISTANT INSPECTOR.—Mr. R. L. Hunt, Birmingham.

#### PRIZES FOR IMPLEMENTS.

##### DRILLS.

JUDGES.—J. Hicken, Bourton, Rugby. J. Thompson, Badminton. F. Sherborn, Bedford.

General Purpose Drill.—First prize, £10, Priest and Woolnough, Kingston-on-Thames. Second of £8, Hornaby and Sons, Grantham. Third of £7, J. Coultas, Jun., Grantham.

Corn Drills.—First prize, £8, J. Saintry, Burnham, Lynn. Second of £7, Priest and Woolnough. Third of £6, J. Coultas, Jun.

Corn Drills for Small Occupations.—First prize, £8, J. Saintry. Second of £5, Priest and Woolnough. Third of £4, Hornaby and Sons.

Corn Drills for Hill-side Delivery.—First prize, £7, J. Coultas, Jun. Second of £3, Holmes and Son, Norwich.

Drills for Turnips on the Flat.—First prize, £8, Priest and Woolnough. Second of £7, J. Coultas, Jun. Third of £5, Hornaby and Sons.

Drills for Turnips, &c., on the Ridge.—First prize, £8, Gower and Sons, Winchfield, Hants. Second of £7, Priest and Woolnough. Third of £5, Gower and Sons.

Drills on the Ridge.—First prize, £8, R. and J. Reeves, Westbury, Wilts. Second of £7, R. and J. Reeves. Third of £5, J. Coultas, Jun.

Drills for Small Seeds.—First prize, £6, Hornaby and Sons. Second of £4, Priest and Woolnough.

Drill Presses.—First prize, £8, Gower and Sons. Second of £4, W. Gerrans, Tregony, Grampound.

*Highly Commended*: Priest and Woolnough, for general purpose drill; Hornaby and Sons, for corn drill; Geo. Lewis of Kettering and Holmes and Son, for corn drill for small occupation; R. and J. Reeves, for drill for turnips, &c., on the flat; R. and J. Reeves, for drill for turnips, &c., on the ridge; J. Coultas, Jun., for drill for small seeds.

*Commended*: R. and J. Reeves and J. Coultas, Jun., for



general purpose drill; A. W. Gower and Son (for two) corn drill; J. Coultas, Jun., for corn drill for small occupations.

#### MANURE DISTRIBUTORS.

JUDGES.—R. Dyson, A. H. Johnson, and others.

Distributors for Dry Manure.—First prize, £8, J. Saintry. Second of £7, Priest and Woolnough.

Distributors for Liquid Manure.—The prize of £10, R. and J. Reeves.

*Highly Commended:* Hornsby and Sons, for distributor for dry manure.

*Commended:* J. Coultas, Jun., for distributor for dry manure.

#### HORSE HOES.

JUDGES.—As for Drills.

Horse Hoes for General Purposes.—First prize, £6, J. Saintry. Second of £5, Priest and Woolnough. Third of £4, William Smith, Kettering.

Horse Hoes for single row—Ridge and Flat.—First prize, £4 10s., Carson and Toone, Warrminster. Second of £3, Page and Co., Bedford. Third of £3 10s., William Smith.

Single Row Grubbers.—First prize, £6, Carson and Toone. Second of £4, R. Tinkler, Pearnth.

Horse Hoes for thinning Turnips.—The prize of £5, Eaton and Son, Thrapston.

*Highly Commended:* J. Bowden, Chagford, Exeter, and John Davey, Crasthole, Cornwall, for single-row horse hoe for ridge and flat; J. Bowden, for single-row grubber.

*Commended:* R. Tinkler, for single-row horse hoe for ridge and flat.

#### MOWING MACHINES.

JUDGES.—T. J. Bramwell, Great George-street, Westminster. H. B. Caldwell, Lackham House, Chippenham.

J. Coleman, Southfields, Wandsworth.

G. Martin, Thorny, Peterborough.

E. Wortley, Ridlington, Uppingham.

Grass Mowing Machine, Class 1.—First prize, £10, W. A. Wood, Upper Thames-street, London. Second of £8, Hornsby and Sons. Third of £7, H. Kearsley, Ripon.

Combined Mowing and Reaping Machine, Class 3.—First prize, £8, Hornsby and Sons. Second of £7, W. A. Wood. Third of £5, A. C. Bamlett, Thirak.

*Highly Commended:* Burgess and Key, for grass mower; H. Kearsley, for combined mowing and reaping machine.

*Commended:* D. H. Barber, Liverpool, for combined mowing and reaping machine.

#### REAPING MACHINES.

JUDGES.—As for Mowing Machines.

One-horse Reaper, Class 4.—First prize, £9, W. A. Wood. Second of £7, Samuelson and Co., Banbury. Third of £5, Hornsby and Sons.

Two-horse Reaper, Class 2.—First prize, £10, Hornsby and Sons. Prizes of £5 each, Hornsby and Sons, and Pickaley, Sims and Co., Leigh, Manchester.

Reaping Machine, with Self-side Delivery, Class 1.—First prize, £25, Hornsby and Sons. Second of £15, Samuelson and Co.

*Highly Commended:* Cuthbert, Bedale, for one-horse manual reaping machine.

#### HAYMAKING MACHINES.

JUDGES.—J. Hicken, Bourton, Rugby.

A. H. Johnson, Gunnersbury, Acton.

R. Sherborn, Bedford.

First prize, £8, J. and F. Howard, Bedford. Second of £5, J. and F. Howard. Third of £4, R. Boby, Bury St. Edmunds.

*Highly Commended:* W. N. Nicholson, Newark, for hay-making machine.

*Commended:* A. and T. Fry, for haymaking machine.

#### HORSE RAKES.

JUDGES.—As for Haymakers.

Horse Rake.—First prize, £6, J. and F. Howard, Second of £4, Page and Co., Bedford.

*Highly Commended:* John Davey, for horse rake.

*Commended:* T. Allcock, Ratcliffe-on-Trent, for horse rake.

#### WAGGONS.

JUDGES (and for Carts and Miscellaneous).—J. Thompson, Badminton.

J. Wilson, Manor House, Woodhorn, Morpeth.

Pair-horse Waggon.—First prize, £10, Beverley Iron and Waggon Company. Second of £9, W. Ball and Son, Rothwell, Kettering. Third of £4, Thomas Milford and Son, Thorverton, Devon.

Other Waggon.—Prize of £10, Hayes and Son, Stamford.

*Highly Commended:* Beverley Iron and Waggon Co., for other waggon.

*Commended:* G. Milford, Thorverton, Devon, for pair-horse waggon; T. Milford and Son, for other waggon.

#### CARTS.

Single-horse Cart.—First prize, £4 10s., Hayes and Son. Second of £3, Woods and Cocksedge, Stowmarket. Third of £2 10s., Ball and Son.

Two-horse Cart.—First prize, £4 10s., Hayes and Son. Second of £3, Thomas Milford and Son. Third of £2 10s., Beverley Iron and Waggon Co.

Harvest Carts.—First prize, £4 10s., Beverley Iron and Waggon Co. Second of £3, Hayes and Son. Third of £2 10s., A. and T. Fry, Bristol.

Market Cart on Springs.—First prize, £6, R. Puckering and Co., Beverley. Second of £4, Beverley Iron and Waggon Co.

*Highly Commended:* Beverley Iron and Waggon Co., for single horse carts; Frank P. Milford, for two-horse cart; Beverley Iron and Waggon Co., for market cart on springs.

*Commended:* Thomas Milford and Son, for single-horse cart; George Milford, for two-horse cart.

#### MISCELLANEOUS.

Silver Medals to A. W. Gower and Son, for broadcast seed distributor; F. Mellard, Uttoxeter, for Pugh's patent cheese-making machine; J. G. Avery, Regent-street, London, for "Jebb's" tubular churn; Ransomes and Sims, Ipswich, for semi-circular pomelrees; West of England Engineering and Coker Canvas Co., Martock, for combined fax-breaking and scutching machine; W. S. Underhill, Newport, Salop, for "Sketchley's" combined sawing, planing, moulding, and boring machine; Alfred E. Pierce, Hammersmith, for improved cattle troughs; Holmes and Sons, for rotary harrow (new implement).

*Highly Commended:* White and Co., Bedford-street, London, for earth closet apparatus.

*Commended:* Ashby and Jeffery, Stamford, for set of patent steel crank shields; Geo. P. Dodge, Upper Thames-street, London, for set of India-rubber vulcanized driving bands; Webb and Sons, Stowmarket, for leather machine bands.

[Messrs. Garrett, of Leiston, are the sole manufacturers of Mr. Saintry's implements.]

#### STEWARDS OF IMPLEMENTS:

Mr. Torr, Aylesby Manor, Great Grimby, Lincolnshire.

Earl Cathcart, Thornton-le-street, Thirak.

Mr. Sanday, Holme Pierrepont, Notts.

Sir E. O. Kerrison, Bart., Broms Hall, Soole, Suffolk, Steward Elect.

#### CONSULTING ENGINEERS:

Messrs. Easton and Amos, Grove, Great Guildford-street, S.E.

#### HONORARY DIRECTOR OF THE SHOW:

Mr. T. B. Brandreth Gibbs, Half Moon-street, Piccadilly.

## THE BREEDS OF CATTLE BEST SUITED FOR ULSTER.

At the last meeting of the North-east Agricultural Association of Ireland, Mr. R. O. PRINGLE, of the *Farmers' Gazette*, read the following paper:—In discussing the subject at present under consideration—the breeds of cattle best suited for Ulster—there are some points which require to be taken into account. If the inquiry had been confined to a single county or district, the matter would have been brought into narrow compass; but Ulster presents a variety of circumstances, which necessarily affect the character of the stock most suitable for different places. We find, for instance, large tracts of fertile, low-lying lands, and, again, equally extensive ranges which consist chiefly of elevated mountain pastures, where stock-keeping is pursued under very different conditions from those which affect farmers in more genial localities. Then there are districts of a middle character: we cannot call them fertile plains, nor are they exposed mountain tracts; yet the natural character of these districts must be taken into account when we wish to find what description of cattle is likely to be

most suitable for them. Ulster is also conspicuous from the prevalence of small farms, of which there is a larger proportion in the northern province than in any of the other provinces into which Ireland is divided; and, though this fact does not necessarily affect the description of cattle best suited for a particular district, yet it does affect cattle management in those districts, and is altogether too important a matter to be wholly overlooked. Ulster has never enjoyed the same reputation as a cattle-producing province that has for many years been possessed by the other provinces; yet we are well aware that, wherever the subject has been properly attended to in Ulster, the results have proved that as good cattle can be produced in "the Black North" as in any part of Ireland. The latest information we possess on the subject, as given in the general abstracts of Irish agricultural statistics for 1864, shows that there are in Ulster 928,383 head of cattle, of which 480,659 are milch cows. If we take the different classes given in the Registrar-General's returns as an index of

the cattle trade of Ulster, we must at once perceive that only a limited proportion is retained after they are two years old. The majority seem to pass from the rearers' into other hands, so as not again to come into the annual stock-taking while under two years old. The business of the Ulster farmers is, therefore, to rear young cattle chiefly for exportation; and this fact assists us in arriving at certain conclusions affecting the question we have now under consideration. Those who purchase the young beasts reared in Ulster naturally wish to have a thrifty description of cattle, which will grow and fatten readily when put on good keep; and it is the interest of the Ulster farmer to supply his customer with the kind of animal which best suits that customer's views. There is one breed of cattle which possesses in an eminent degree that disposition to attain maturity at an early age, which is so valuable a characteristic in the estimation of those who are engaged in the final processes of the meat manufacture—in finishing the animals for the use of the butcher; and it is evident that the more closely the young stock which are bred in Ulster are allied to this breed, the better will be the demand for them. It is scarcely necessary to say that I mean the shorthorned breed of cattle; and, wherever local circumstances are favourable, I feel assured that shorthorns, or crosses of that breed, will be found the most suitable description of cattle to rear in Ulster. The first mention I find made of shorthorns, in connection with Ulster, occurs in the Rev. John Dubourdieu's "Statistical Survey of the county of Antrim," which was published in 1812. He says: "A few years ago, Sir Henry Vane brought a bull and some cows from Durham to Glenarm; they were of the shorthorned breed, from Colling; they were large and well shaped, of a fine deep red colour, mixed with white, but reckoned too heavy for general use, though the soil about Glenarm Castle, where I saw them, was fit for beasts of very great size; but the climate, I have heard, did not agree well with them, and they have been sent back." The breed is now better understood, and the really first-rate shorthorns which have been bred at Glenmore, Castlegrove, Glasslough, Clandeboy, and other places, have satisfactorily proved that neither the soil nor the climate of Ulster is unfavourable to that breed. What is also of great consequence, a larger proportion of more suitable winter food is now grown in Ulster, in the shape of root crops, than at the time when the late rector of Anahilt wrote his "Survey of the County of Antrim." This, of course, has had due effect on cattle breeding, for food and stock must go together, and there is now a much more earnest spirit evinced as regards the improvement of the breed of cattle, by means of pure-blooded shorthorns, than there was even when I first knew Ulster, twenty years ago. Still there are many districts where but little improvement can be seen in the cattle bred and reared in those parts of the country; and, in order to stimulate those who have it in their power to promote improvement where such is required, we shall just glance at what has been done of late years in other parts of Ulster. Those who are acquainted with the district will bear me out in saying that there is not, perhaps, another district in Ulster, of similar extent, where improvement in cattle breeding has been more rapid, or of a more marked character, than it has been in that part of the county of Down which is included in the Downpatrick Union. So much is this the case that Mr. Chaloner, of Kingsfort, who has been long famous as a breeder of shorthorns, declared, when acting as one of the judges at the show of the Downpatrick Union Agricultural Society, held in 1863, that "he considered the cattle exhibited in the second class at the show that day were the best he had ever seen in his life." This was high praise; and Mr. Chaloner afterwards backed it by again stating that "their second or tenants' class was a credit to their county. He had never seen so good a second class in his life." Sixteen or seventeen years ago there were scarcely half-a-dozen of beasts at a Downpatrick show worthy of being looked at twice. And how has this change been effected? Simply by some of the landlords, and particularly by two who own extensive properties in the district, namely Lord Bangor and Mr. Maxwell, of Finnebrogue, having prudently gone the right way to work by providing a sufficient supply of pure-blooded shorthorned bulls, of which not only their own tenants, but those also of other proprietors, have availed themselves. The young cattle—yearlings and two year olds—bred in this way are worth in the market more than double the value of unimproved cattle of the same age, bred in the district, but the produce of a bad

description of bulls. One of the great mistakes made by a certain class of farmers is to suppose that all sorts of cows ought to produce first-rate stock when put to well-bred bulls; and when they find that such is not the case, then they are apt to fancy that good bulls are not so valuable as some say they are. Another and a general fault is, not growing enough turnips to winter the improved cattle as highly as possible, and thus obtain even a higher general range of prices than is at present realized for them. I am not exactly aware of the proportion of turnips which is grown in that part of the County Down, but I do know that in travelling through it, turnip fields are not seen as often as should be the case. I find, moreover, that, taking the county at large, there is only about one acre in twenty of the area actually in cultivation under turnips, and that is by far too limited a growth of the most important crop which a farmer can cultivate. This, therefore, is a point which must be amended if it is considered desirable to improve the breeds of cattle in Ulster, to increase the number of stock reared in the province, and to reap the full advantage of an introduction of good blood. Mr. Maxwell and Lord Bangor may indeed, as Mr. Samuel Morrow said at the meeting of the Downpatrick Society, to which I have referred, have "cut a rod to whip themselves," when Mr. Morrow and others can go into a show-yard now-a-days and carry off the leading prizes. But this is the very object to attain which both Mr. Maxwell and Lord Bangor have been labouring for years; and I am convinced they feel more gratification from having so far succeeded than if they had continued to make the race and divide the prizes, while the tenant farmers only followed at a great distance, scarcely within sight of the winners. Allow me to say that a similar motive should actuate all landlords in Ulster; for it is obviously their interest that the cattle bred by the farmers in the province shall be improved as much as possible. I put all considerations of what is called "duty" out of the question, for, in reality, it is merely a matter of pounds, shillings, and pence. If the use of well-bred shorthorn bulls more than doubles the value of the young stock, as we have seen has been the result in Lecale, this is just a doubling of the amount of cattle at the disposal of the farmers; and if the value of the stock may be still further increased by a more extended system of root crop cultivation, then this is also a pounds, shillings, and pence affair affecting materially the interests of landed proprietors; for everything which increases the tenant's capital renders him better able to face the agent when rent-day comes round, and not only better able to do this, but better able to provide for his family. The course to be adopted is plain, and money expended upon the purchase of good bulls, for the use of the tenantry on any estate, is money well laid out, returning an amount of interest beyond that which can be obtained from any other mode of investment. To buy a bad description of bulls, on the other hand, is just to throw the money away. In speaking of the pure shorthorn as the best breed, in my opinion, for improving the ordinary description of cattle in Ulster, where natural circumstances are favourable to the introduction of that breed, it is possible some may object that shorthorns are not good cattle for the dairy, different ideas on the subject appearing to prevail in different parts of the country. Yet objections to shorthorn cows are, perhaps, not altogether without foundation; but it must be remembered that it is not of high bred cows of which I am now speaking, but of well bred bulls, as being desirable for the improvement of the ordinary breeds of the cattle in the country. For it must be taken into consideration that everything comes to the butcher's scales at last; and, while our milch cows produce heifer calves which may, perhaps, be reared into dairy cows before they reach their final destination, they also produce bull calves, which, as bullocks, form a considerable proportion of the stock which is fattened when between two and four years old. A disposition to fatten readily, with weight of carcase and a good quality of flesh, must be looked for, and when this can be obtained without injuring the milking properties of any well-known dairy breed, then a most important object will have been accomplished; and I maintain that all this can be done, although the highest bred shorthorn bulls in the kingdom are used in crossing a purely dairy breed. It is as well to state at this point that the more highly bred a bull is, the more likely is success to follow crossing. This is an essential principle, and I hold there is not, nor ever was, a bull at Warley too highly bred for crossing purposes, if used with judgment. Now,

there is one well-known dairy breed to which many in the North are partial—I mean the Ayrshire. But, however suitable the pure Ayrshire may be, simply for the dairy, especially where the pasture is not of a rich description, they are not graziers' beasts. The breed has been long cultivated entirely for its milking properties, and the points which indicate an animal of which the carcass will yield a good proportion of valuable roasting pieces are wanting. Size is also wanting, a very great consideration, provided the size is of the right sort, and does not arise from large, coarse bones; and of late I have seen a tendency to overlook fixity of type even in prize animals, when the milking points were all right. Thus we have been accustomed to consider well-defined patches of red and white as essential in an Ayrshire, but I have seen black Ayrshires, and others black and white—that is, they were entered in the Ayrshire sections at Scotch shows, and got prizes as being pure bred. This may be all right enough, but I doubt it, and certainly such awards upset all our ideas of Ayrshire colours at least. But shorthorn bulls have been used in crossing Ayrshire cows, and the cross, while improved in form for beef purposes, has not been injured in its milking properties, at least to any serious extent. A change, however, seems to take place in the quality of the milk. This was first pointed out to me by Mr. McLean, Clermont Park, near Dundalk, who is a very acute and close observer of such matters. His experience, founded on repeated trials, was that the crosses of the Ayrshire with the shorthorn yield milk which produces more butter than the pure Ayrshire, while the milk yielded by the latter produces more cheese. Mr. McLean does not pursue crossing beyond the first cross. There is one thing which must be observed, namely, that as the crosses are heavier animals than the pure Ayrshires, they require fuller keep. So far as the Ayrshires are concerned, considered as a pure breed, it must not be forgotten that a most competent judge of stock has placed on record his opinion that "no other breed can equal them for the converting of the produce of poor and medium soils into butter and cheese." This, therefore, in their peculiar province; but when the butcher's stall is kept in view, and where due provision is made for a heavier description of stock, they should be crossed with the shorthorn. But it may not be out of place if I offer a few observations on the prevailing idea that all pure shorthorn cows are necessarily bad milkers. There is not a doubt that the original shorthorns were heavy milkers, and of this we find good evidence in George Culley's "Observations on Live Stock," the third edition of which was published in 1801. He says: "The shorthorn, or Dutch kind, differ from the other breeds in the shortness of their horns, and in being wider and thicker in their form or mould; consequently, feed to the most weight, in affording by much the greatest quantity of tallow when fattened, in having very thin hides, and much less hair upon them than any other breed (Alderneys excepted); but the most essential difference consists in the quantity of milk they give beyond any other breed; the great quantity of milk, thinness of their hides, and little hair is probably the reason why they are tenderer than the other kinds (Alderneys excepted). It is said of this kind, and I suppose very justly, that they eat more food than any of the other breeds; nor shall we wonder at this, when we consider that they excel in those three valuable particulars—viz, in affording the greatest quantity of beef, tallow, and milk." He adds the following in a foot-note: "There are instances of cows giving 36 quarts of milk per day, and of 48 firkins of butter being made from a dairy of 12 cows; but the more general quantity is 3 firkins per cow in a season, and 24 quarts of milk daily." Now, Culley's conjunction of "the greatest quantity of beef, tallow, and milk," as being afforded by shorthorns as compared with other breeds, would, I fear, be scarcely allowed to them by many at the present day; and it is evident that in the process of improving the breed in some of the points in which Culley states they were deficient when he wrote—constitution, for example—the milking properties of the breed have been in some degree sacrificed. We find an indication of this even in Culley's time; for a little further on he says, still alluding to the shorthorns, that "the object of extraordinarily large size is not now so much the pursuit of the enlightened breeders of this neighbourhood"—the country on both sides of the river Tees—"as the more valuable property of getting fat at an early age." Culley's idea of early maturity extended no farther than that shorthorn steers were capable of being sold fat to the butcher when three years old, and the following is

the system of management he describes as being pursued with those steers, in order to fatten them at that age: "The first winter they have hay and turnips; the following summer coarse pasture; the second winter straw in a fold yard, and a few turnips once a day, in an adjoining field, just sufficient to prevent the straw from binding them too much; the next summer tolerably good pasture; and the third winter as many turnips as they can eat, and in every respect treated as fattening cattle." The result was that "enlightened breeders," as Culley says, "frequently sell their three-year-old steers to the butcher exceedingly fat in May for £20 a piece." Now, at the present day "enlightened breeders" would not consider the system described by Culley as being of a liberal nature, calculated to bring out "the valuable property," as he justly terms it, "of getting fat at an early age;" for with cake, and corn, and turnips, the two first-named feeding stuffs being supplied not only during winter, but also on the grass in summer and autumn, shorthorn steers, and crosses got by shorthorn bulls, reach the butcher a year sooner than his limit, and even at an earlier age. Giving prominence to early maturity, and continuing to do so for successive generations, has rendered that property permanent; but it has led those who considered it the chief characteristic of shorthorns to overlook altogether another property for which the early shorthorns were famous—to wit, their extraordinary qualifications as dairy cattle. Still, as if to vindicate the character of the breed, or as evincing a tendency to run back to the original, we now and then meet with striking instances of heavy milkers in cows whose pedigrees show "dukes in dozens." After some remarks on the Royal Farms at Windsor, and the shorthorns of Mr. Welsted, of Ballywalter, co. Cork, Mr. Pringle concluded as follows:—I mentioned at the commencement of this paper that there are extensive ranges of mountain pastures in Ulster; and, where such is the case, breeds suitable to the climate and the land must be looked for. There is one native Irish breed well suited for such cases, to which I consider it most desirable that more attention were paid. I mean the Kerry, which is usually looked upon as a fancy breed, but, nevertheless, possesses certain properties eminently deserving of consideration. Kerry cows are excellent milkers, and not only are they so, but they fatten rapidly when dry, and "die well." The great misfortune is that Keries have been left to nature in a great measure, and I have long felt convinced that anyone who had the taste and judgment to do so would find it to be his interest to set to work and improve the Kerry breed—not by crossing, but by judicious selection. They would make first-rate dairy cows for small farmers in hilly districts where keep is often not over-plentiful, and when brought to better pasture would be found to pay the grazier, and please both butchers and consumers. The West Highland breed has been successfully introduced into Donegal, and in other exposed districts the Galloway might be bred and reared with advantage. Galloways were at one time very common in many parts of Ulster, and to the present day a polled bullock or heifer will not stand long unsold in a fair. In fact, it sometimes happens that beasts which would be horned if left as Nature intended are manufactured into polled cattle in order to meet the views of those who prefer hornless animals. There is a great deal of middling land in Ulster well suited for breeding Galloway cattle, and it must be remembered that this breed is always in demand—the bullocks for grazing purposes, and the heifers for putting to shorthorn bulls, in order to obtain those splendid crosses which suit the fancy of the London West End butchers. The Galloways, however, are purely graziers' beasts, and not to be depended upon for the dairy. Of late, Lord Cremorne has introduced into the county Monaghan the polled Suffolk breed, which has long been held in high estimation as dairy cattle. The experience which has been obtained of them at Darry confirms the justness of this opinion, and there is little doubt that crosses of them with the shorthorn will make a valuable description of cattle for the grazier. I have thus endeavoured to lay before you some facts which tend to show the breeds of cattle best suited for Ulster; and, in conclusion, I must again press upon you the important fact that it is not enough to decide what breeds are best suited for the province: you must begin at the beginning, and combine with this the question of cattle-feeding crops; for, unless due provision is made of such, it will be impossible to realize all the advantages which should be obtained from the introduction of good breeds of cattle.

## RECLAIMING OF LAND FROM THE OCEAN.

The sea is ever taking and giving land, reducing the superficial area of some provinces, and increasing that of others. At one time there is reason to believe that England was united to France, or, in other words, formed part of the Continent of Europe; but a broad restless ocean now rolls between them, and every year is adding to the breadth and depth of the channel. Eventually, it has been calculated by some clever theorist, the southern counties, if not the whole of Merry Old England, will be no where to be found above the troubled surface of the sea; but the conclusion is premature, for every day's experience is fast teaching practical people how better to hold their own, even with old Ocean himself, and not only so, but to regain much of what has hitherto been lost. Around the whole of the shores of our sea-girt isles, much fine land has already been reclaimed, more especially at the mouths of our large rivers: much remains to be reclaimed, because new soil is annually being formed; so that, upon the whole, England is annually adding to the number of her broad acres.

What we propose chiefly to discuss at this time are the increased facilities afforded by the recent progress made in the different branches of applied science, connected with the subject, for the reclaiming of land from the ocean, and of bringing under profitable aration large areas of comparatively barren land that lies high and dry above the highest tides. We allude principally to the progress made in steam culture, locomotion, and railway conveyance, together with an almost unlimited supply of artificial manures, for forcing land as it were into a profitable crop-bearing fertility.

Where a proper foundation can be got for an embankment, works of this kind can now be made of almost any magnitude, through the instrumentality of steam and railway accommodation: and besides cheapness of conveyance and expedition of work, the "iron way" affords facilities for bringing suitable materials from a distance for the formation of the embankment, which in the olden time was wholly impracticable. And it not only enables landowners to form proper embankments, but also to improve the land that has thus been reclaimed, by draining, fencing, building, and the mixing of soils, together with steam-cultivation, so as to make the whole affair from first to last a light undertaking, as compared with similar works, when conveyance and works of every kind had to be done by horse-power and water.

And besides the large areas that require embanking, there are, along the whole of our sea shores, nooks, corners, and long strips of sandy downs, shingle, and naked rock, amounting in the gross to thousands of acres, that can be profitably converted, by the same means, into rich garden ground and paddocks for cottagers. No doubt, in many cases the expense of reclaiming such land may amount to fully the equivalent of what it is worth, so that landowners would only get short interest for their capital thus invested; but this cannot be raised as a legitimate objection to the improvement in question, for besides obtaining fair interest on capital invested in such improvements in the shape of rent, an indirect advantage would often be gained of perhaps a greater value, such as a reduction of poor-rates, taxes, &c. It must ever be borne in mind, as a cardinal maxim in our political economy that whatever increases the productive resources of the country, reduces its taxation and public burdens, at the same time that it augments its general prosperity. It is very evident, therefore, that the indirect advantages which a landowner in many cases may derive from improvements of the kind in question fall very little short of being equal to the rent directly obtained for the land.

When new land is formed at the mouth of a river, it is often difficult to determine upon a proper foundation for a sea embankment of any great magnitude. This arises chiefly from the unstable character of the newly formed soil, owing to the manner the work of formation is performed. If there is, for example, much sandy matter brought down by the river with a deficiency of clay and organic element, then layers of comparatively pure sand will be formed during a long stormy period; while during high tides and river floods, with a smooth sea, this thin bed of fine sand will be covered with a lamina of a

different character, the washed-up silt being a sort of muddy clay, containing a large per-centage of vegetable matter. The former, the sand bed, will hold water; the latter will have a tendency to the reverse; consequently the sandy strata, however thin it may be, will be filled at every tide with water, so that at low water it will possess boggy spewy properties — properties which are familiar to all who have examined practically such soils. To lay the foundation of a large embankment upon such a deceitful base would be fatal; and yet there is often no alternative practice that can be adopted, more especially where the embankment extends in any part beyond low-water mark, as is often the case.

In such examples it is common to form an embankment of a sufficient height to keep out an ordinary tide; next, to cut down in the middle an open longitudinal channel, until a proper foundation is arrived at, and then to fill this channel with pure clay or clayey gravel free from organic matter, that can be rammed into a solid body, impervious to sea water. If this is done effectually throughout, the work will be complete, so long as it is defended from the action of the sea, or the equally destructive agency of insects and vermin that never fail to follow the progress of insectivorous growth; but if the work is carelessly, hastily, and imperfectly done, the upshot need not be told; for although the embankment may stand the test of a long period of years, yet eventually it must give way to the destructive forces continually acting upon it, day and night, without intermission.

The ruin of all embankments is, practically speaking, organic matter; and when it is borne in mind that new soil formed at the mouths of rivers contains a large per-centage of vegetable matter, the magnitude of the task of forming an embankment wholly free from such organic matter will readily be seen in all its length and breadth. Granting, for example, that railways now afford ample facilities for bringing inorganic plastic materials from a distance, if they are not near at hand, capable of forming an impervious lasting work, yet, as the foundation, to perhaps a great depth, is full of a mixture of vegetable matter in a state of slow or rapid decomposition, it follows that unless this matter in a state of chemical change is removed, how can a proper foundation be laid? To mix such vegetable matter with clay in the base of a sea embankment, and to expose that compound to the continuous influence of the atmosphere and vegetable growth on the inside, and to the alternate influence of brackish water and the weather on the outside, is, in the first place, to encourage vegetation with all the destructive changes that annually follow; then, in the second place, to cultivate insectivorous growth; and, finally, an open porous embankment, in character like a honey-comb, liable to be broken through by the force of unusually heavy seas acting against it from the outside. The work of destruction is so manifest to all who have examined sea embankments under the keen eye of a good microscope, as to render the details of the slow but sure work of ruin unnecessary.

For some time we occupied a farm, the greater area of which was reclaimed from the sea at the mouth of a large navigable river. The outside of the embankment was turfed, and not being very much exposed to the action of the waves of the sea it was easily kept in order, save in one or two places. But in watching and studying the action of the waves upon this embankment, and upon other more exposed embankments which could not be defended down to the bottom by a green sward, it often occurred to us that, as a general rule, all sea-embankments should have a greater slope than is generally given them, and be wholly covered to a considerable depth by pure sea or water-worn shingle, or gravel. In short, face the embankment with stone or anything at command in preference to vegetation. On the side next a navigable river, facing the whole embankment with a rude causeway of stone would often be the cheapest finish in the long run, and the best from the commencement; for, there is seldom much difficulty experienced in securing a permanent foundation at low water sufficiently far below the bed of the river as to prevent harm being sustained from the reaction of the water against the sloping front of a

stone-faced embankment down to the river's edge at low water—even in the most stormy weather where the river is of considerable breadth and the waves consequently of considerable magnitude, and force upwards and downwards. Next to the sea the expense of a stone-facing would, no doubt, be objected to in innumerable cases where fresh soil was being formed outside, and where reed and other sea plants were annually extending their dominion seawards. But even in those examples, a facing of bare, barren gravel would be preferable to one of vegetation, so to speak, the extra material required to form a long slope being reduced by railway conveyance to a minimum estimate, far below the advantages to be derived on the other side. And this conclusion will be found supported by the facts of the case, even granting that the gravelly facing becomes ultimately covered with a green sward, there naturally being plants adapted to all sorts of soil, for such a soil will always remain a poor one, not adapted for insectivorous growth, and hence would not be liable to destructive consequences that follow the depredations of this all-devouring brood. In other words, the embankment would preserve its original strength to resist the force of the highest tide.

The outside slope of an embankment should be curved like the letter S, the left-hand or concave side of the letter being that exposed to the waves of the sea or river; and the concave curve below and convex curve above should both be that of the parabola, and not that of the circle. In this respect the slope resembles the curvature of the water-course of a breast or under-shot wheel, the convexity above and the concavity below being such that the water flows freely down, without showing a broken surface. This is the natural slope formed by the sea itself rolling against a water-worn gravelly beach; and the practical rule which nature thus lays down is that which the landowner and those whom he may employ should carefully reduce to practice, because the waves of the sea in working up and down such a slope do less harm, more especially at top and bottom, than when it is a regular inclined-plane from top to bottom throughout, and this should be the form of the slope, whatever may be the kind of material of which it is made and faced, whether of clay, gravel, stone, or green sward.

The inside slope may be a regular incline, and assuming that the great body of the embankment is composed of clayey gravel suitable for the work, it should be covered with a thick layer of ferruginous gravel or sand, so as to form a pan, as it were, of a character such as to prevent the roots of plants penetrating the embankment, thereby destroying its permanent stability. Above this there may be a coating of poor sandy or gravelly earth, no thicker than is sufficient to produce a tough sward of inferior herbage, such as goats would refuse to eat. The practical philosophy of all this must appear so plain to those who have any experience in *rich, rotten, sea-embankments*, suffering from the gnawing mandibles of insects, and the ceaseless tooth of vermin, and trampling, pitting feet of cattle, that it would be almost superfluous to say a word more under this head; for, if inorganic materials are those of which our embankments should be made, then the logical inference is manifestly to preserve them in all their inorganic qualities perfect and entire.

Such are some of the principal practical data that require to be carefully taken into consideration by every landowner or company of landowners before he or they give a surveyor orders to make the survey of the lands to be reclaimed, and to stake out the embankments, farms, fields, roads, offices, &c.; and if the ocean and river are annually casting up fresh soil, the survey may include a less or greater area outside the embankment for future reclamation than that inside; and in examples of an unfavourable subsoil, the quality of the latter may, in a great measure, determine the position of the embankment; for if there is the prospect of a better foundation being got in a few years further out seawards, it may be advisable to place the present embankment nearer the land, in order to obtain a sure foundation, although it may inclose a less area of land than is reclaimable at the time. Landowners have, for the most part, intelligent men in their employment, as drainers, hedgers, &c., who are qualified to bore to any depth in the proposed line of the embankment, so as to ascertain if proper foundations can be got for it; and not unfrequently a preliminary survey is made, including an outer and inner line, so that an embankment can be made anywhere between the two; and when this is done, the general survey for laying-out the whole area to be reclaimed into farms, &c., is postponed until

the embankment is finished, and the reclaimed land in a condition for being carefully measured with the chain.

If the area to be reclaimed is large, and much of it too soft for chain-lines being accurately measured, a preliminary trigonometrical survey is advisable, in the majority of examples, as it enables landowners to calculate the cost, size, and number of farms, together with the probable rental in return for the investments before they get themselves peculiarly involved with contractors. Too great caution in this respect cannot be exercised, and the advances recently made in the laying down of temporary railways, for the conveyance of materials, and in machinery of all kinds required for the performance of the work, requires a greater degree of circumspection than formerly; and the preliminary survey should embrace not only the area to be reclaimed, but the field or area from which the materials are to be dug for the embankment, together with the temporary line of rails for the conveyance of the same, so as to place the whole details of cost within easy calculation.

On large estates, where a land-surveyor is regularly employed, and not unfrequently an agricultural engineer also, for controlling improvements, the preliminary survey and the examination of the land to be reclaimed will devolve upon them, in which case they relieve their employer of much responsibility, whether the work is to be contracted for, or done under the immediate superintendence of the engineer of the estate; and even upon lesser estates, where landowners do not keep such officials upon their staff, it is often not the worst plan to employ professional men, such as land-surveyors and engineers, to superintend the whole of the preliminary works referred to above, such as the boring of the embankment, to determine the line of the embankment; the setting of poles, both for the embankment-line and the levels; and the fixing upon a proper supply of embanking, building, and road-making materials.

When these preliminary steps are taken, and the work of reclaiming finally determined upon and started, the details of carrying it out may be of a rough and heavy character, yet, when reduced to a practical form, the sum-total of the whole amounts simply to so many cubic yards of embanking materials, conveyed a certain distance, and put together with apparently more brute-force than skill. The recent improvements in railways have greatly simplified the rougher and heavier part of the work, advancing in a still higher degree the expeditious performance of it. The quality of the materials, and also the quality of the work done, are also both improved, generally speaking; but when careless hands are employed, the quality of the work requires sharp looking after, more especially contract-jobs, when undertaken through undue competition.

Two other branches of the work, whose performance is greatly facilitated by the recent improvements in question, remain to be noticed—the first, the expedition with which embanking materials can be conveyed, for preserving the channels of rivers in their proper seaward direction, so as to prevent their action with the ocean from encroaching upon and washing away land already formed; and the second, for conveying fresh soil for covering or mixing with pure seawashed sand or gravel, and for filling up pools, channels, &c.

There are very few seaward landed estates where landowners are keeping their own with the ocean; and whatever may have been the plea formerly, under old-school times, there are very few examples of this kind at the mouths of rivers, where they can now justify their conduct in allowing fine rich land to be gradually undermined, tumbled down yard after yard, and finally washed out to the ocean. The tenant in possession, and in many cases the landowner also, may have no command of materials capable of preventing such encroachments; but there is always a plentiful supply somewhere in the locality, within an easy, come-at-able railway distance; and Statute Law should make ample provision for its application when required, on fair terms as to price.

It is obviously the bounden duty of Parliament to make suitable provision for the safety of the country in this respect from the encroachments of the ocean; and as both the landowners involved, with the seller and purchaser of the materials for embanking, are equally interested, the general public conclusion is manifest. In perhaps ninety-nine cases out of every hundred, landowners have the materials upon their own estates; but just so much the more need is there for legislative provision for the single exception in every hundred examples otherwise situated.

The same line of railway laid down for the conveyance of

embanking and building materials would also, in many cases, convey a different description of materials for levelling and covering barren soils and the like. It is one thing to reclaim land from the ocean, but quite another branch of improvement to put the land thus gained from the sea and river into a profitable, crop-bearing state. In many cases the sea-spray and blasting winds render lands that are lying high-and-dry barren, comparatively speaking. Now, in numbers of such

cases which we are personally familiar with, a sea-wall or a high embankment, with a few inches of fresh soil over the area thus protected, as a top-dressing, would reclaim and convert such lands into a rich, profitable, crop-bearing state, returning ample interest on the capital invested, provided the work is economically executed, under the many advances of applied science recently brought to bear upon this branch of agriculture.

TEQMETPHE.

## KINGSCOTE AGRICULTURAL ASSOCIATION.

On Wednesday, May 24th, Mr. Church gave his fourth lecture on Chemistry. On the answers being returned to his last questions, he remarked that they were well done, and that had he put marks to them, each would have received at least 80 marks out of 100. After shortly referring to the former lecture, Mr. Church remarked, that although the mode of testing the guano, which he described at their last lecture, showed that it was adulterated with 10 per cent. of sand, the mode of testing did not show what other adulterations were present; for instance, there might be salt, which would dissolve and pass away with the liquid; there might be peat or any fine loam, which had been used as adulterations; for the detection of these and other substances, further tests were requisite. He then explained how the *volatility* of a substance may sometimes be used as a means of detecting adulteration. He stated that all ammonia salts were more or less volatile, and gave to the class some adulterated sulphate of ammonia. This, if pure, would, on exposure to the heat of a spirit lamp in a porcelain crucible, completely volatilise, leaving no more residuum than 1 to 1½ per cent. The class were requested to determine at home the amount of adulteration in the sample. Mr. Church stated that the substances added could not be detected by either of the processes mentioned in the last lecture, as it was *soluble*, but *not volatile*. He next called attention to the *symbols* used in chemistry; this substance, *sulphate of ammonia*, for instance, is represented by chemists by the letters N.H. 4 S.O. 4, which has the advantage of being much shorter, and at the same time gives the *elements* of which the substance is composed, namely, one part of nitrogen, four parts of hydrogen, one part of sulphur, and four of oxygen. It was the custom to write this and other compounds in this way, N.H.O.4, S.O.3, which expressed the idea of the substance being sulphate of the oxide of ammonium. Chemists, however, now preferred to put all the oxygen together, as expressed in the former arrangement of symbols, as although they knew that amount of oxygen was present, they did not know in what manner it was combined. Ordinary sulphuric acid, or oil of vitriol, was thus expressed, H.S.O.4, which, when added to zinc, formed sulphate of zinc, which was expressed by Zu. S.O.4, implying that there were present in the compound, one part of zinc, one of sulphur, and four of oxygen. The elementary bodies were found to combine in fixed proportions by weight. Thus, water, when pure, consisted of the two elements, hydrogen and oxygen, and its symbol was H.O.; and by weight they combined in the proportion of 1 to 8; thus, when there was one grain or part of hydrogen, there were always eight grains or parts of oxygen. From careful observation of these proportions, what was called the *atomic weight* of each element was determined.

By the next lecture Mr. Church said he would have a table drawn out, showing the symbols and the atomic weights of a number of the principal elements with which the class would have to deal. One advantage of this knowledge of atomic weights was that, supposing they had a quantity of good bones containing a fixed quantity of phosphate of lime, they could tell exactly what quantity by weight of sulphuric acid they should add to make the bones into superphosphate of lime. This was most important to manufacturers. A *Formula* in chemistry was the mode of expressing by symbols the elements—thus Na—which was the symbol for Sodium, and whose atomic weight was 23, and Cl the symbol for Chlorine, whose atomic weight was 35½; when combined chemically, formed common salt—the formula for which was Na. Cl—and its atomic weight was 58½. Chemistry proper had to do then with the elements found in the air, water, and the earth. The air was composed of two elements, the water of two, and there

were about sixty other elements found in the earth, but they should not have to do with more than about 35. Taking hydrogen first—its atomic weight was the highest body in nature, and was, on this account, used for inflating balloons. Taking the *specific gravity* of air as 1, that of hydrogen was .0692; or a balloon inflated with air, and weighing 1000 lbs., when inflated with hydrogen would weigh only 69 lbs.

Mr. Church then showed how hydrogen was made by adding sulphuric acid H.S.O.4 to zinc Zu—sulphate of zinc (Zu. S.O. 3) being formed, and the hydrogen escaping. The zinc used was granulated, or flattened, prepared by allowing the melted zinc to fall from some height into water. To obtain the part by weight of hydrogen in this operation it was requisite to use 40 parts of sulphuric acid, and 32½ parts of zinc. The formula showing the process would be thus chemically expressed:—

	Atomic	
	Symbols. Weight.	
	{ H. ... 1	Hydrogen off in gas.
Sulphuric Acid...	{ S. ... 16	
	{ O.4... 32	Sulphate of Lime—Zu.S.O.4.
Zinc .....	{ Zu... 32.5	

This experiment illustrated the use of the pneumatic trough, the pressure of the atmosphere on the water causing it to rise in the inverted jar, and how the hydrogen escaping, passing along a tube, and carried under the jar, displaces the water; also the process of pouring the gas so collected from the large jar by means of a funnel upwards into a small test tube, the process being exactly the reverse of pouring water downwards from one vessel to another: the care also necessary to be taken to drive out the air from the flask. Whilst air remained mixed with the hydrogen the mixture was highly explosive (as exemplified), but when the hydrogen was pure it burnt with a bluish flame. To obtain some *pure hydrogen* Mr. Church took a small piece of sodium, which, when first cut, showed clearly the metallic lustre; this, however, disappeared almost immediately, the affinity for oxygen being so great, oxide of sodium or soda being formed. In consequence of this tendency to absorb oxygen, it was necessary to preserve sodium from contact with air or water, by keeping it in naphtha. It was this great affinity for oxygen which enabled it to separate the elements of water, liberating the hydrogen. When a small piece of sodium was dropped on the water, violent chemical action immediately followed, the sodium running about on the surface of the water, and rapidly becoming lessened in bulk. To collect the hydrogen in a test tube great care was requisite; the sodium was folded carefully in paper to prevent contact with the water until it was put into the tube. The experiment was quite successful, and a test tube full of pure hydrogen was soon obtained, which, when lighted, burned with a pale blue flame, the hydrogen being kept up to the edge of the test tube by the skilful addition of water, as combustion proceeded. The formula showing the process would be thus expressed:—

Water ...	{ H. ... 1	Hydrogen off in gas.
	{ O. ... 8	
Sodium...	Na... 23	81—Na. O.—oxide of sodium or soda.

The following questions were given to be answered by the class:—1. What is meant by a substance being volatile? 2. Analyze the adulterated sample of sulphate of ammonia which has been adulterated with common salt. Find out how much has been added.—3. Give the symbol for hydrogen and zinc, and the form and formula for sulphuric acid, which is sulphate of hydrogen, and for sulphate of zinc.—4. How do you prepare hydrogen?—5. What is meant by the expression atomic weight, and what use may be made of a knowledge of atomic weight?

## TEXTLESS NOTES.

BY A CROTCHETT FARMER.

An authority upon agricultural questions, alike in its cultural and its social features—no less an authority because he is nameless here—has given it as his opinion, in connexion with the “farm and domestic service question,” that “a master is served just as he deserves.” Not for the present to enter into any statement as to how deserving the best among t us masters may be, nor to do more than merely allude to the fact that I fear that, if we were judged according to our deserts, we might get less than we often get, still it will be worth while to examine into the truth or no-truth of this statement above-quoted. At first sight, it appears to be one of those sharp, sententious sayings that in the compass of a word or two comprises all that can or need be said on the subject, embodying that which cannot be gainsaid. Now, if it means anything, it means this—that if a master deserves to be ill-used, he is ill-used; and *vice versa*. Here, at the outset, the difficulty meets us, Who is to be the judge as to whether the master really deserves to be ill-served? What constitutes the sin which brings the punishment? Of course, it is easy to see that the two standards by which he is to be judged—his own, and that of his servant—will be different, or, at all events, are very likely so to be. What the servant may very naturally be sure to consider, in the master's conduct, as the ill desert which brings the ill service, is just as likely to be considered by the master a point worthy of praise, and duly to be esteemed by the servant as a benefit bestowed upon him. Leaving for the present this difficulty to be unsolved, as unsolved I fear it will long be, under the present circumstances of labour and service on the one side, and of masters on the other, let us suppose the case of a master whose conduct to his servant is all that can be desired by the most exacting of people. Let us suppose him to be anxious not only to consult the comfort of his servant in the main points of daily life, but in those little ones in attention to which kindness of disposition is best displayed. Let the master sacrifice frequently his own purposes—nay, his own ease and comfort—to aid the one and add to the other of his servant; let him act as his guide and comforter in mental suffering, his soother in all troubles, the easer of all toils; let him be, in point of fact, a father, using that term in its fullest and finest meaning—is it true that, because the master, as every one will readily admit in such a case, really deserves to be well served, he is sure to be well served. Surely it is no uncommon thing for a master now-and-then to be met with, who does in all his dealings carry into practical operation those just, generous, and philanthropic—or we may say Christian principles, for this term includes all that is noble and good—in his dealings with his servants; and yet it does happen that kindness is met by carelessness, generosity by trickery and dishonesty, and all the deservings of good by the doings of ill service. Much truth, alas! is there in the statement that the good doing does not always, nay, does not usually meet with the good return. Although we are told that we are bound as Christians to do unto others as we *would* that others will do unto us, it does not follow that they will; nor is it consistent, I take it, with the principle of this golden rule, that we are to do good in order to get good done to us. It would be a grand thing for the mutual relationship of master and servant, were it to be de-

cided by the principle—if principle it is—enunciated in the saying with which I have commenced my paper; but the stern realities of life tell us truly enough, if sadly enough, that the good master does not always secure the good servant; that, in truth, it is as many of my readers will heartily and readily agree with me, that in too many instances the fact is patent—that the more kind and considerate the master, the worse is his servant. To such an extent is this true, that I have heard one who in every way is entitled to be an authority state it as his belief that it was hopeless, in the great majority of cases, to expect a return for any good thing done to servants beyond the usual hard legal requirements of the position, remarking at the same time that a very painful result of any attempt on the part of the master to make the servant more than usually comfortable, or to express any interest in his welfare, is accepted by the servant as a kind of tacit acknowledgment on the part of the master that his servant is to be feared, and therefore to be bribed—these acts of extra judicial kindness being looked upon as bribes—and all attempts to be interested in their welfare as an interference with their rights. Let us hope that this is not true in many cases: true it is in a few, I dare to say. Nor shall I consider any of my readers otherwise than as a very happy man if he has not in his experience met with a practical corroboration of it. Nor need we wonder at this peculiar relation existing between master and servant, if we take into consideration the very peculiar training, mental and moral, which the class of servants has had—a training which I fear inculcates, at all events aids very much the fostering of a jealousy, which scarcely admits of anything the master does being viewed in any light other than that disparaging to his character as a kind, judicious, and considerate master. Nor do I deny, or am disposed to deny, that, on the other hand, there is a degree of jealousy on the part of the master with reference to the dealings of his servants towards him. But right sure am I that this jealousy of the masters is not the same in kind or degree, or so subversive of all that is good in the relationship of master and servant. At the same time, while saying all this, and by no means ignoring the faults of either masters or servants, I think there is abundant reason to believe that much of the difficulty existing in the relationship between master and servant would be got rid of, if the mere feeling of mutual utility to each other was cultivated and suffered to tinge daily practice. For it is a queer thing, so to call it, that in spite of all the experience we as a nation have had on this very question, we seem to be as far off as ever from a right understanding of the important mutuality of dependency existing between masters and servants. We act as if we could at any time do without the aid of the other; hence arise “strikes and lock outs,” those clumsy expedients to get rid of difficulties, which, like all clumsy expedients, fail utterly in doing that which alone right principles can do. It is suicidal for the hands to say to the head “We can do without you.” As much so it is for the head to ignore the strength of the arms or the speed of the feet. When antagonism of interests is replaced by mutuality, and jealousy of one another replaced by confidence, we may then be on the look-out for a very different state of matters between masters and servants than at present exists. How best



to change this is engrossing the attention of the best thinkers of the day.

To return to that dictum with which I commenced my paper—if indeed, I have at all lost sight of it—I believe, notwithstanding what I have said about it, that it does contain the true germ of practical utility and moral worth, the application of which will result in effecting that reform or change in the great question of service to which in the close of the last paragraph I have alluded. While by no means believing that it is true that man will be well served simply because he deserves to be so—for the

experience of all past life tells us that this cannot be true so long as ingratitude, carelessness, and other forms of vice and crime exist amongst us—there is no doubt that the true way for the master to do, in all his dealings with his servants, is to deserve to be well served. While there is no doubt of this, there is also little doubt of the converse, that the servant must on his part try to serve well. What constitutes, then, the deservings of the master and the doings of the servant? A brief glance at these points will not lack utility and interest: that glance will form the subject of future "Textless Notes."

## ASSOCIATED DAIRIES AND CHEESE FACTORIES IN AMERICA.

The advantages of association in the conduct and management of manufactures and of arts, lying in those channels where associated capital has been employed, are pretty generally understood and appreciated by the public; but the farmer has for the most part supposed his business to be of a character that would not easily adapt itself to this principle. In America, however, central factories for butter and cheese have been established, and find increasing favour. Within a brief period several corporations have been formed for making cheese under the general manufacturing law of New York. The stock is divided into small shares, and generally distributed as much as possible among the dairymen of the neighbourhood, with a view of creating a general desire for the success of the institution, and enlisting efforts to secure patronage.

Early last year a convention was held at Rome, in the State of New York, to form a state cheese-manufacturers' association, at which there were representatives from 69 cheese factories, with from 150 to 1,000 cows each. The society was formed, many very valuable reports submitted, and the whole subject of cheese-making discussed in its various branches.

The advantages claimed for the factory system are superior quality, uniformity, higher prices, saving by buying wholesale all the materials requisite, and finally, relieving the farmer and his family from the drudgery of the manufacture and cure of cheese. It is not pretended that a better quality of cheese can be made at the factory than in families, but that it is quite as fine as the best, and therefore above the average of that manufactured in small parcels.

The objections urged against cheese factories are, the difficulty of detecting adulterated milk, the carrying of milk to the factory, and liability of sour milk, difference in quality of milk arising from the manner in which cows are fed and managed, the loss of the whey, necessity of manufacturing "the early and late made cheese" in families. These are the principal objections urged by dairymen.

By the plan of association the milk of a neighbourhood is collected at the most eligible point, where, with an abundance of cold water, it is easily kept from souring during the night, and is then manufactured by experienced persons, whose attention is not divided between the household, farm, and dairy, as is frequently the case in the old way. Factory-made cheese is quoted one or two cents more per pound in the market than that of ordinary dairies, thereby paying for its own manufacture. It is apparent that cheese in large quantities well-made, of uniform style and flavour, will bring a higher price than a dozen or fifteen lots, each of which differs from the other in its appearance and flavour.

There is much less shrinking also in large than small cheese. Two or three persons under a competent manager can take care of the milk of 400 or 500 cows, which would require a dozen or fifteen persons in the old way. Originally the milk received at the cheese-factory was

wholly purchased by the manufacturers, it being estimated and paid for by the amount of curd it produced when pressed. This plan failed to give entire satisfaction to the dairymen, because of differences of opinion upon its prospective value in the fall market, but furnished sufficient data for determining every item of expense attending the manufacture, and for deducing the cardinal features of the commission method. Hence the dairymen were left to accept a price for their milk or curd which the manufacturers felt safe in offering, or allow them 1 dollar per cwt. of cheese manufactured and the whey, for performing the work of making, curing, preparing for market, selling the cheese, receiving and disbursing the moneys; the dairymen paying all other expenses, as boxes, bandage, salt, rennet, &c. These two methods were practised together, each having about an equal number of adherents for a few years; the latter, however, gradually growing in favour, until it has become the general rule among the older factories. In some instances slight variations in the detail of the original terms have been made.

The question on which the American dairymen are just now debating is whether cheese will maintain its present high price. The inexorable law of supply and demand will continue to control this, as it does everything else. A few figures taken from the American census reports will throw some light on this subject. There was more cheese shipped from America in 1800 than in 1830 by half a million pounds. From 1830 to 1840 the exports of cheese increased 54 per cent. From 1840 to 1850 from 1,784,471 lbs. to 10,361,189 lbs., or nearly 600 per cent. From 1850 to 1860 the shipments increased to 23,252,712 lbs., which is within a fraction of 124 per cent. In 1861 there was an increase of over 4,000,000 lbs., or 72 per cent.; and in 1862 the exports were about 60,000,000 lbs., or 50 per cent. over any previous year. The value of the shipments, at 11 cents per lb., would be about £132,000. There is not a large breadth of country in which cheese is produced. As a people the Americans consume vastly more butter and fat meat than Germany or Great Britain, but less cheese. From 1850 to 1860 the United States increased in the manufacture of butter 46 per cent., but in cheese less than one per cent. In the State of New York the manufacture of butter increased in these ten years 26,000,000 lbs.; but cheese decreased 1,000,000 lbs. The same is true of Pennsylvania, only varying the proportions somewhat. These facts, taken in connexion with the advance in exchange, have produced the present high prices of cheese. The demand has increased faster than the supply, and therefore prices rule high.

Whether the system of association will stand the test of years, and become general throughout old dairy districts, is a question which only time and experience can determine. So far the plan seems to work well, and promises good results; but it is new, and how much is due to novelty for its success we are of course unable to state.



## RIVER FISHERY IMPROVEMENT.

The application of the sewage of towns to the land—anywhere and in any manner—is vastly preferable to the present practice of pouring it into our rivers, thereby polluting them, contaminating at the same time the atmosphere of the large valleys in which they flow, thus rendering the same a source of pestilence instead of a source of health and wealth, as they otherwise would be to the country. The two practices may have their respective advantages and disadvantages; but, making every allowance for these, there nevertheless remains a difference in favour of the former, the application of the sewage to the land so great as to leave no grounds for a diversity of opinion upon the general practical conclusion involved.

To the land with the sewage of every town, village, and hamlet in the kingdom! is therefore a proposition that may be definitely laid down as an established national maxim in "*farmers' politics*" for the future. The solution of the old question, as to which is the best method of utilizing sewage, is virtually excluded; for, however bad the plan adopted by this or that enterprising company may be, it is infinitely better than no sewage-practice at all.

The proposition is clearly a settled one that calls for its universal reduction to practice. We may quote the application of the sewage of the northern half of the capital to the Maplin Sands as an example; and if a second company can find a similar area of land, even although at a greater distance from the capital on the southern side of the Thames, for the other division, it would be the bounden duty of Parliament and the Government to grant that company the necessary statutory means for the diversion of the sewage from the river, and its application to the lands in question. Both examples may be faulty in the extreme; but so far as the preservation of the purity of the river is concerned the work is complete, and therefore the Legislature has no alternative left but to act thus far in accordance with the practical demands of the facts of the case at issue, due provision being made that the two companies shall receive a monopoly of the sewage for no longer a term than their claims absolutely require and justify.

The general question is of very voluminous character in every respect, and therefore it requires to be thoroughly investigated in all its practical details. It may for this purpose be profitably divided into two distinct and separate propositions—the first, the improvement of our river fisheries, and, the second, the utilization of the sewage of towns. Each of the two propositions involves of itself a great work, even when confined to any single river, as the Thames, as it embraces the whole length of that river, from its source to its confluence with the ocean, and consequently the reduction to practice of the counter-proposition, or the application to the land of the sewage of all the towns that is now drained into the Thames and its tributaries, thus including, not only the metropolis, but also Oxford, Reading, Windsor, Colchester, Ipswich, &c., together with all the smaller towns and villages, the latter by far too numerous to mention individually, although the smallest of them may have as great an interest in both works, in proportion to its population, as the largest, and in some cases perhaps a greater interest than has the British capital itself.

To convert the Thames into a clear crystal stream, literally brimful with fish of every fin, and to make the atmosphere of the great valley through which the monarch river flows majestically equally pure, is a national undertaking well worthy of the enterprising genius of the current age. To the wealthy inhabitants of the capital it has many things to commend it that are hardly possible to be enumerated, such as the purity of the atmosphere along both banks of the river. Below London Bridge the immense shipping would no doubt be somewhat against the improvement of the river from a pisciculture point of view, but not to that extent which some may apprehend; for fish, like most land-animals, become familiar with whatever they are daily associated, such as ships, provided the essential requirements of health are present, viz. pure water. If hares and rabbits, for example, become so familiarized with railways as to make their nesting places under the rails, and there nestle and bring up their young; what may not fish do in our rivers

when once the water in them is sufficiently pure to supply all the elements of health in the highest degree? To all who have studied the peculiar habits of the finny race that inhabit and frequent our rivers, the great national work is practically a *clear one*; give a fish *clear water* in plentiful supply, and they will multiply in fruitful abundance almost beyond the calculation of the most enthusiastic pisciculturist in the kingdom. But below London Bridge, and even Westminster Bridge, the agitation of the river by steam-boats, and the consequent suspension of mud in the water, is a far greater obstruction to improvement than the presence of the immense shipping in question. But it is possible to obviate this continual muddy state of the water to a very great extent, if an effectual remedy cannot be applied with advantage owing to the heavy expense which all artificial river improvements generally incur. Such artificial improvements being of general application to other navigable rivers as well as to the Thames, they require special consideration, and therefore we shall briefly notice the improvement of the Thames in this respect as a practical illustration.

The complete diversion of all the sewage that now flows into the river Thames and its tributaries, and its application to land, is a work that would of itself effect to a very great extent the purity of the water; a very large proportion of all the matter held mechanically in suspension being derived from town-sewage directly and indirectly. In the first place, for example, sewage contains a large amount of matter thus held in suspension, that is daily washed or flushed into the river. In the second place, thousands of tons of this matter are thus being daily deposited in the bed of the river, as may be seen by any one who will take the trouble to investigate the subject practically at low water. Much of this deposit being of an organic character is daily undergoing those changes to which all organized matter is subject; hence the obnoxious smells encountered when the bed of the river is approached, either during the ebbing or flowing tide, more especially in hot weather. Here also its porous character and levity, and the manner it is easily agitated by the action of steam-boats or vessels of any kind plying up and down, more especially against the current of the tide or river. Now, it is very evident that were the continuous influx of such sewage matter obviated, the onward action of the fresh-water current of the river, together with the decomposition of the old organic matter, would gradually effect the purity of the water every season, making a tangible improvement in advance of its immediate predecessor. In this manner the continuous changes to the better that would annually take place would be in favour both of the purity of the water of the river and also of the atmosphere along its course, so that it were difficult to put a practical estimate upon the ultimate effects produced.

Again, the thorough drainage of the provinces is gradually producing a cleansing effect upon the waters of rivers. No doubt at first, when the land is newly drained, a larger amount of muddy sediment is washed out of the soil into the drains—and by the quicker removal of the rain-water it is thus carried into the river—than was done prior to the work of artificial drainage; but the objection is an exception that has not a general application, for when the drains are properly put into the ground the water which they discharge will eventually be purer and freer from mud than the water which flows from the surface of undrained land of a similar quality; consequently, the general conclusion of experience supports the soundness of the proposition as regards the ultimate cleansing effects of drainage upon river water.

And, lastly, deprived of both these sources of a supply of muddy matter, the beds of rivers would be so washed as to be greatly cleared of light matter capable of being held in suspension under an ordinary state of the river; consequently, they would eventually become of a gravelly and sandy character throughout, and thus be better adapted for the production of the more valuable kinds of fish, and, indeed, for the breeding and maturity of all kinds of fish, for there are no fish that do well in water that is kept continually muddy and literally

thick with suspended matter, obnoxious to health. Some parts of the beds of rivers would be more sandy and gravelly than others, owing to the differences of inclination, and, consequently, the velocity and the washing action of the stream; so that different kinds of fish would naturally find out what suited their respective physiological requirements.

The intelligent reader cannot fail to see, through these cursory remarks on river-fishery reform, very important improvements looming in the distance, and at no very great distance either, in many cases. In the Metropolis, for example, the whole of the sewage on both sides, north and south, will very soon be diverted from the river, and applied to the fertilization of the adjoining counties. The cleansing effect of this upon the water will very soon manifest itself in each of the above three respects. And we may here observe that the action of the shipping below London Bridge will greatly aid in the cleansing process, by agitating the water, and thus keeping the organic and more light portion of the sediment afloat as it were, thereby washing it down to the sea, until the whole bed of the river eventually becomes free from mud, it being covered throughout with washed sand and gravel. Hitherto the very reverse of this cleansing process has been experienced along the whole channel of the Thames, from its confluence to the ocean, owing to the increase of the population in the provinces through which it flows, and other sources of pollution. But the diversion of the sewage of the capital to the Maplin Sands, &c., forms a turning point in the history of events, so that every chapter of the future will chronicle its own onward advances in the march of improvement. The embankment of both sides of the river is another work of a kindred character, for it will greatly assist in the cleansing process. And the improvements thus going on in the capital are of general application to almost all the principal rivers in the kingdom, together with their innumerable tributaries; for provincial towns and landowners are everywhere paying more attention to the science and practice of drainage, so as to secure a more uniform flow, and thus prevent both the silting up of channels and the washing away of soil during heavy storms. All these things indicate in a very decided and satisfactory manner the direction in which the finger of Progress is pointing in the management of our rivers, and the grand result of all cannot fail to be an augmentation of the population, together with an increase in the productiveness of our river-fisheries and of the land on both banks, both of animal and vegetable products.

The practical conclusion at which we have thus arrived is, according to the old maxim, "*almost too good to be true*," and yet it is manifest that a different one cannot be deduced from the facts of the case. In other words, inasmuch as the practice hitherto followed has had for its effect an annual increase in the pollution of rivers from an increase of sewage, &c., so the diversion of the sewage and its application, together with the general prohibition of deleterious substances being allowed to flow from landward manufactories and the like, and the commencement of the natural cleansing process, will gradually produce the contrary effect. Flowing water has a natural tendency or operation to purify itself, partly by the decomposition of organic matter, the primary elements of the same being discharged into the atmosphere in a gaseous form, and partly by the deposit of all inorganic matter, either in the bed of the river, or else in the formation of new land on either side where it enters the ocean. This new land was being formed at the mouths of all our large rivers long before the country was inhabited, and consequently before any sewage was thrown into them to pollute their waters; and the area of land thus formed will be found to be inversely as the flow of the river, but directly as its magnitude. And why? Because the washing process of cleansing the channel is directly as the flow of the river. Hence the pure crystal streams of our mountain districts, and the muddy character of the sluggish volume of water that slowly and almost imperceptibly winds its meandering course through our large level valleys to the ocean, and in which the tide ebbs and flows in a manner so as to aid in the formation of new land on both sides of the estuary.

The universal cry now being raised against mill-weirs, and every obstruction to the natural flow of rivers, and the improvement of the channel of tidal rivers so as to obviate what in old charts are termed "races," "pools," and "sand-banks," merits a special notice, as it shows in a very forcible manner the go-

a-head spirit of the age, and the general determination of the public to advance the cause of progress by every means at command. The reader will perceive that the removal of such obstructions and the general improvement of the tidal portion of channels are simply for the purpose of increasing the flow of rivers uniformly throughout their length, thereby not only preventing the deposit of mud, but promoting the natural washing and cleansing process noticed above, and hence at the same time to cultivate the production of fish. And when we further add to this advocacy, that of the application of the sewage of towns to the land, the general conclusion may prudently be left to speak for itself.

How far all such improvements will have a tendency to retard the natural formation of new land at the estuaries of our large rivers is another question that calls for special consideration. In the case of the Maplin Sands and the formation of new land at the mouth of the Thames, the purification of the river will greatly retard the formative process from the tide; but on the other hand, the application of the sewage directly will add thousands of tons annually of solid matter to the surface of the reclaimed lands, and thus raise it faster than under the old tidal process. These are data that require to be duly taken into calculation by sewage companies who propose the application of sewage to lands reclaimed from the tidal rivers and the ocean, as they determine in a great measure the proper position of embankments and the area of lands that should at once be reclaimed. And more than this; for in many cases, if not the vast majority, peat-earth, clay, and earthy matter may be largely mixed with the flowing sewage by artificial means, so as greatly to increase the annual deposit of fresh soil upon the newly-reclaimed land, thereby rapidly raising its surface eventually, it may be in some examples, to the top of the embankment. According to the old proverb: "Lay clay on sand and you buy land;" and in all cases where there is a command of clay or other earthy matter to mix with the sewage on its way to sandy and gravelly lands, this old proverb naturally suggests the practice that should be followed.

PISCATOR.

**HABITS OF THE CUCKOO.**—It is a remarkable fact that the cuckoo, although itself insectivorous, most frequently leaves its eggs in the nests of seed-eating birds, which, nevertheless, distinguish their own young from the foster brood, which are fed with their natural insect diet, whilst the little finches are supplied with vegetable food. A cuckoo was once found just feathered in the nest of a hedge-chanter. It was taken thence and placed in a cage containing a hen canary. Strange to say, as soon as some small caterpillars were put into the cage, the canary fed the little stranger with these larvae, although she herself continued to eat the seed to which she had been accustomed. The cuckoo appears to be about the size of a common pigeon; in fact, however, it is not quite so large, the thickness and abundance of its plumage making this bird seem to be of greater bulk than it really is. The eggs are curiously small for the bird which lays them, and the nestling when first hatched is, of course, proportionate to the egg whence it emerged. The young cuckoo, however, grows very rapidly, as might be supposed from the dimensions which it attains when fully grown. The eggs are of a dull pink hue, speckled with a deeper shade of the same colour.—*The Queen.*

**DOUBLE-YOKED EGGS.**—A correspondent observes in the *Naturalist's Scrap Book* that he found an uncommonly large nest of the green linnet (*Fringilla chloris*) containing four eggs, two of which presented nothing worthy of remark, the third was much longer and curiously pointed, whilst the fourth was the size of an average skylark's. Each of the latter contained two birds, and, unfortunately, incubation had proceeded so far there was no chance of preserving the shells, which were tender and thin to an extreme. He adds that he had not the slightest doubt, had another week elapsed without disturbance, that three live birds, if not four, would have been hatched from the two eggs.

## THE BEDFORDSHIRE AGRICULTURAL SOCIETY.

## MEETING AT BEDFORD.

Such as were present last autumn at Biggleswade, and remember the way in which the little Vicarage Close was set-up as a show-ground, could scarcely have been prepared for the change that has come over the fortunes of the Bedfordshire Agricultural Society. Much of this amendment is no doubt attributable to the time of the meeting having, at the suggestion of Mr. Charles Howard, been brought forward to the summer season, though we cannot credit this as the sole cause of so extraordinary an advance. The prize-list has, for instance, been considerably extended, as the spirit manifest amongst the exhibitors would seem to have increased in a like proportion, while the management has ably answered the further call made upon its exertions. In a word, Friday last was the best day the old Bedfordshire Society has known for many a long year, despite the elements having relented at last, and the parched-up earth being refreshed with a good soaking rain on Thursday night, that continued at intervals throughout the following day, and rather told against the effect of the cattle-show itself, as well as the variegated glories of its near neighbourhood, the horticultural fête. The committee, however, were forearmed, and for the first time had the horses and beasts housed in comfortable standings, backed by the ample rings they were enabled to plan out at the Priory; as they had, in fact, the whole of their arrangements as complete as possible, down to the dinner laid out handy in one of the Messrs. Howard's spacious warehouses, and a building which, alike from the space afforded and the system of ventilation employed, was admirably adapted to the occasion. A number of ladies, moreover, responded to the invitation now first issued, and graced the feast with their presence, the tables being otherwise very fairly filled, notwithstanding the heavy rain which was falling at the hour announced. As the morning had partially cleared up, the attendance on the ground was also very good, while with more favourable weather the meeting must have been a bumper.

And there was certainly something worth coming to see, the horse section of the show, the more particularly when compared with what it has been, being of remarkable excellence. Nearly all the chief classes, either for nags, or horses used for agricultural purposes, were well filled, with the competition in some cases so close as to make the awards very like a mere matter of fancy. In the pairs, for instance, of heavy-draught horses, the thirteen entries were generally commended, with three of these "couples" receiving the further distinction of high commendation, while it is probable that another set of judges might have given the prize to some other one of the four lots to which the competition was ultimately reduced. Weighty, hardy, handsome, and active, we never remember to have seen a better illustration of cart-horses in work, though it must be added that the merit of the

class was pointed by the pairs entered by Messrs. James and Frederick Howard, of the Britannia Works. This firm sent into the ring eight Essex bays and browns, two of which took the prize, with four of the others obtaining two of the high-commendations, and the other special compliment going to a very good pair exhibited by Mr. Battams, of Liddington. The pick of the two prize horses is well known about the country, where, with the light-blue plough at his heels, he has played his part in many a prize match, though it is doubtful whether for power and substance on a short leg, as exemplified in the pair of dark browns, they had not as many or more admirers on the outside of the ring, if they did not perhaps step quite so smartly as their conquerors. There was, however, altogether so much proof here afforded of the worth and use of the Essex bays for agricultural purposes, as to raise the continual query why the Essex farmers should desert their own colours for the Suffolk chestnuts? There was another strong entry of cart mares and foals, with Lord St. John taking first with a deep clever black mare, and Mr. Bennett of Bletsoe second, for a compact young roan, backed by a long way the best foal of the lot. The younger classes of agricultural horses were not so commendable either for numbers or merit, and the two-year-old cart geldings did not make up an entry; while for two-year-old fillies Mr. Eve, of Silsoe sent in by far the best, and Mr. Street, of Harrowden, a very moderate second. The Messrs. Howard claimed the best yearling colt, and Mr. Gudgin the first of the four fillies, but in neither class was there anything extraordinary to dwell over. The entry of cart stallions included a number of horses of some note, of which Mr. John Manning's four-year-old, The Black Prince, was pronounced the best, as no doubt he was, being a colt with good looks, light action, and plenty of promise. Mr. Manning also took the prize for the best stallion for getting hunters, but not with the same general acquiescence. The class was a short and a bad one, though the judges differed as to the decision, the one maintaining that the brown horse did not look well-bred enough to get hunters, and so going, from sheer necessity, for a nicely-topped horse, but with very middling forelegs, called Cornerstone. However, the referee gave his award in favour of the cocktail, which turned out to be "A British Statesman," a winner at the Royal Meetings ere the Council came to the sound conclusion that for getting hunters a stallion must be thorough-bred. We should advise the Bedfordshire Society to make the same stipulation forthwith, or they can never hope to establish any proper system of breeding hunters, with the encouragement of mongrels to begin upon. The hunter class itself ran to a long entry, in which were to be found two or three horses that have been distinguished on other public occasions, such as Mr.

Battams' Tophorne and Mr. Metcalf's Gayhurst, either frequent winner over a country. But old Tophorne has not appearance enough for mere show, and Mr. Battams had a far better-looking black, could he be brought to bend himself properly, and that, as it was, deservedly reached to second here, with high commendation. The grey Gayhurst, also said to be not exactly a pleasant horse to ride, still comported himself very creditably over the hurdles, and being a wonderfully good-looking one, Mr. Metcalf took the premium with him; a bay of Mr. Mitchell's being commended. The four-year-olds were not so imposing a lot, with Mr. Lindsell's Fair Star by Glenmasson as the best of them; and the two classes of hackneys, though famously filled so far as mere numbers went, brought more bad ones together than we ever saw previously in a ring. There was scarcely anything that could move, and Mr. Wilson's bay, which after some consideration took Colonel Higgins' premium, went so short and shifty that she stood no chance whatever in the open class against Mr. Arkwright's beautiful black mare by Meteor—not exactly “a hackney,” after all, but which looked a deal more like carrying one pleasantly than anything else, despite her chipped knee and terribly capped hock. In the hunting brood mares Mr. Boulton got first, with an old brown said to be by Lanercost, and with the repute of throwing capital stock, as she had certainly a wonderfully handsome foal by Alvediston at her foot. The produce of Mr. Hill's very nice chestnut mare, on the contrary, rather pulled down the mother, and she so got no further than the barren honour of a high commendation. Mr. Purser's prize pony was a very model of a horse; and a clever grey of Mr. Horrell's, being above the standard, took a high commendation amongst the extra stock; but the ponies generally were by no means Little Wonders to look on.

The Shorthorns are now established as the breed of cattle for the country, and the Messrs. Howard, How, Fowler, Pawlett, Crouch, Wythes, Barnett, and others were as usual well represented. The Messrs. Howard, however, must be distinguished as Mr. Charles Howard, of Biddenham, and his two brothers, James and Frederick, who have an example farm of their own, where Clydesdale and Essex horses, Shorthorn cattle, Oxford sheep, and Yorkshire pigs are all carefully cultivated. The firm made their mark here with Claret, purchased at the Clifton Pastures sale, and that now in-calf and in-milk took the first prize in a strong class of cows, with their brother's famous Lady Selina Spencer second and his Grace Howard third, as highly commended; while Mr. Pawlett's Isabella Rose, “a great coarse cow,” as we said of her at Biggleswade, was merely commended. It was thought that Claret would have stood well in for the town Cup had she been entered; but in her absence this went again to Mr. Lynn's Pride, a cow too well known by this to need any further description here; Stroxtton also winning the town prize for heifers with Pamela, “low, lengthy, and good,” as we wrote of her at Hereford. Mr. Pawlett's was first and first amongst the older bulls with Hopewell and Prince Hopewell, as amongst the yearlings Mr. How, of Broughton, was pronounced to possess the best in a son of First Fruits, and Mr. Charles Howard the second with Thorndale Knightly—some terribly high-bred cattle here. The Biddenham herd was first and second for bull calves with Syllabub and Clifton Gwynne, and first for heifers in-milk or in-calf with Fortuna Gwynne; the Beeston sample reaching to second with Charmer 7th. Mr. Crouch won with no competition in the two-year-old class, and again amongst the

yearlings, but in the face of some very powerful opposition. Ruth, indeed, had to beat Mr. Pawlett's Fair Bell, a good second, as well as two others highly commended from Biddenham and from Branches Park; as this, no doubt, was one of the most evenly-filled classes in the catalogue. Mr. Pawlett claimed the best heifer-calf with Charmer 8th, and Lady Pigot the second with Victoria Rubicunda; while the premiums for fat stock went to Mr. Fowler, of Henlow, who took two firsts and a second in the three classes; to Mr. Alfred Rogers first for a fat ox, to Mr. Charles Howard second in the same class; and to Mr. James Howe, who showed the Lady of Althelstane as a fat cow, and got second to Mr. Fowler's Nelly with her. The show of Shorthorns was altogether very good, if somewhat short in the bull classes; but there is clearly a deal of good blood available hereabouts.

The sheep show by comparison was rather weak, and we did not mark down any particular pens as sure to be heard of again; excepting Mr. Lynn's Lincoln and Leicester ram, which won as the best of any breed. The Biddenham flock had the great pull with the Oxford Downs; as Mr. Hine came in with his well-known cross, and Mr. Newman with his Longwools; while the Messrs. Howard won the town prize for ewe lambs, as well as the first for wether lambs. The entries in some of these classes, however, were very small, and in some cases with no competition whatever. Very possibly the alteration in the time of meeting does not suit so well with sheep as for other kinds of stock. It clearly did not militate against the pigs, of which there was a capital show, with the two classes of sows-with-pigs and in-pig generally commended. Amongst the former, Mr. Wythes took first with a white, and Mr. Pain of Pavenham second; and in the yet better class of sows in-pig, Mr. Allender claimed first and second with two as clever Berkshires as a man could wish to have, and to the merits of one of which we spoke at Oxford. Mr. Hine showed the best boar, and the Messrs. Howard the second, with the Britannia firm also first for fat pigs, the colour still running on white; a preference the yet farther pointed in the special classes, where Mr. Duckering, the new north-country exhibitor, won with “the best boar and sow,” as we said at Hereford, “in any of the classes; neither too big nor too coarse, but rather as remarkable for their quality as symmetry.”

The judges were Mr. R. Doig, of Lillingstone, and Mr. J. Topham, of Welford, for cattle; Mr. H. Corbet, of the Farmers' Club, and Mr. J. Elliott, of Heathencote, for horses; and Mr. J. Bennett, of Southcott, and Mr. J. Clayden, of Littlebury, for sheep and pigs.

The district ploughing matches, under the auspices of the Society, will take place at Blotsoe and Potton in October; but there was a sheep-shearing trial going on during the day, and, beyond the show of itself at the adjoining works, a few implements were exhibited in the field by the Howards, Page, Sawney, and Samuelson. To the success of the dinner, as presided over by Mr. Stewart, we have already spoken as going very well. The toast list to be sure was just about twice as long as it should have been, and at least a third of this had to be put off to some other opportunity. All the M.P.'s were, of course, present, but politics were carefully avoided, and the only sensational address was that of Mr. Whitbread, who spoke against premiums for good conduct and long service to labourers, amidst a continual chorus of *No! No!* and other strong expressions of dissent, that should surely go to convince the honourable gentleman of how little authority or experience he has on such a subject.

## SUFFOLK AGRICULTURAL ASSOCIATION.

## MEETING AT IPSWICH.

This society has met once more at Ipswich, when Friday was the time, and Fonnereau Park the scene. The people of Ipswich applied themselves manfully to the last of giving the society a cordial welcome. Upwards of £100 was raised for Ipswich special prizes, and at various points arches of evergreens were erected, with banners and devices of the customary character. Everything that could be done was done, but the weather proved unpropitious, and although rain is much wanted for Suffolk crops it was felt that it was out of place at the Suffolk show. The clouds wore a threatening aspect all the morning, and every now and then there was a light shower; as the afternoon advanced, this was succeeded by a determined and continuous down-pour, but by this time the out-door proceedings were over, and if the day was dull, it had at least the advantage of being cool. The show of horses does not appear to be increasing, having amounted to only 207, while five years since, at Framlingham, there were 270 exhibited. The other entries were as follows: Cattle, 78; sheep, 204; swine, 72; cheese, 6; butter, 162; and implements, 496. The show of swine was unusually large, but the entries of cattle and sheep have been exceeded on some occasions.

We were amongst the horses early in the morning; but the rain coming down in earnest, we found it dangerous to pull out our catalogue, and most of the horses were muffled up in thick clothing, with their forms quite hidden from the public gaze. Adding to this the confused manner in which the horses were arranged and the whole was conducted—the classes mixed up together or scattered here or there, instead of being arranged in rows; the smallness of the numbers on the horses, and that only on one side of the head, or oftentimes not at all, and the utter disregard as to their following one another in numerical order; the short time they were stripped and before the judges, or as to which class was judged first—and it was impossible for the public, with a very fair catalogue, to make out to whom most of them belonged, or what they were shown as. "They manage these things much better at other places!" was the general cry. To begin with the riding and coaching classes, there were for the best thoroughbred stallion for hunting purposes four entries, but only three made their appearance in the ring, the absentee being the good-looking old Dr. Sangrado. The first on the list, Viralias the Dutchman, and to whom the judges eventually awarded the first prize, was a sour-headed, coarse-looking, light-middled, scrambling-going son of the Flying Dutchman; yet still preferred to the Ace of Clubs, an elegant, true-made son of Stockwell, and decidedly one of, if not the best looking horse ever shown in this part of the country, and whose good looks would do credit to any showyard in the kingdom. Elmsdale was the other, a very powerful, good-looking four-year-old by Annandale, and a colt that only wants a year or two to make a first-class hunting stallion, having a nice head and neck, a good top, and capital limbs. The judges' decision caused some little astonishment; in fact, people could hardly believe their own eyes when they saw the pink ribbon handed to such a horse, in preference to the beautifully-made couple that stood beside him. We long to see these horses before another bench of judges, firmly believing as we do that the prize was given to the worst horse of the three by a very long way. The first and second prizes for coaching stallions went to

two two-year-olds of Mr. Cooper, the first a rather nice flashy lathy-looking brown, and the second a dull heavy-shouldered bay, beating Mr. Webster's long short-legged chestnut, who, with much more blood, would make a better horse, and a black cob of Captain Barlow's, by North Star, who, if perhaps a little too small for the class, for good looks, style, and action beat the lot into fits. Evening Star, a half-brother to the latter, and equally handsome, was awarded the prize for the best cob stallion with all the character of the cob—a fine forehead and good deep middle, on short legs and with great power. Rejected the best hunting mare with foal at foot, was a good-framed, hardy-looking, old-fashioned mare, and we hear she has been a first-rate performer over the Suffolk banks; the second-best being a lengthy short-legged mare of Mr. Mumford's—a mare of great character, but hardly fashion enough for a hunter of the present day; nevertheless she was dam of the best hunting foal and best two-year-old hunting filly on the ground. A compact short-limbed mare of Mr. Easterton's took first honours out of an entry of three for coaching mares with foal. The prize cob mare was but a common-looking harness hack, with no character of the cob about her: she had a very plain head, but good knee action. Mr. Smith had a cleverish hack, with a rather heavy shoulder, and Lord Henniker a lengthy heavy cob; Mr. Easterton a light game-looking hack, and Mr. Biddell a coarse but useful thing to cross with a blood horse; but Captain Barlow's Gipsy, an old brown varmint short-legged mare, full of character, a previous prize-taker, and the dam of Morning Star, the cob mentioned in the coaching class, took our eye more than any of the others. To show the absurdity of putting half-breds to half-breds with the idea of getting more power than by a thoroughbred horse, we may mention that this mare under fifteen is the dam of one of the best hunters in the county—a mare by Robinson, standing sixteen hands high, and up to as many stone; but when put to the stout half-bred North Star, who looked like trotting off with a ton of weight, she throws a neat cob barely fifteen hands high. The best hunting foal was a plainish big-boned foal by Weatherden; and Mr. Freeman had a very smart nicely got-up foal, but small of bone in the a very small class. Mr. Easterton was the winner of the best coaching foal by Weatherden; but we preferred the beaten one of Lord Henniker's, he having more bone. The prize roadster foal looked as if he had been brought up in a bandbox—a very delicate light-boned thing, and at the best will never make more than a ladies' park hack. Mr. Welton's three-year-old prize hunter by Ravenhill had good action, but was more adapted for harness than hunting; and Mr. Mumford's highly-commended Young Oulston was a horse of immense size, but his legs did not look like lasting. For the best three-year-old mare or gelding for coaching purposes the only entry was pronounced unworthy of merit. For the roadsters there were only two, the prize going to a neat little blood-like hack by Oulston out of Evening Star's dam—a hunting mare by Mundig, that formerly belonged to Asheston Smith. The three two-year-old hunting fillies, we could not find; but the two-year-old coaching filly, rather a nice one, with a big frame, great limbs, and a light head and neck, we accidentally dropped in with;

whilst the two-year-old prize roadster, elected without opposition, was well covered up with clothing. There were a dozen hackneys under seven years old, some of a very fair stamp, but nothing very extraordinary; the first being a lengthy, short-legged, useful chestnut of some character, who also took the cup in the special class; and the second a rather elegant-looking bay. Mr. Green had a short thick useful hack, and a first-rate goer, which though not noticed in this class, took the second cup in the special. The best hunter not exceeding seven years of age, with an entry of eight, went to Kingston, a long low horse of power and character, with a wonderfully good back; the second-best being a varmint, hardy, good-looking mare, with good limbs. Mr. Fish had a good-looking black, and Mr. H. Biddell his prize horse of last year, but who this time did not make his mark. The best coacher under seven was a very good-looking, gentlemanly bay; and in the pony class Mr. Ransome, as usual, had it all his own way, taking two prizes and the cup. Among the lot we just caught sight of a very pretty little grey of Mr. Roper's. Arcan by Ambrose, a rather useful horse, was on the ground as extra stock; and Mr. Grout had a pair of handsome carriage-horses, with which he carried off the cup for match horses. We should have noticed more if we could have ascertained to whom they belonged, but must now pass on among the Suffolks, who mustered about as strong as ever, Mr. Rist carrying off the first prize with a four-year-old son of Chester Emperor; although very light of bone and a decided soft look about him, he will always be difficult to beat in a show-yard, as he has all the show points of his sire, but in our opinion will never be so good or wear so long, and should have been but second to his sire on this occasion. The old Emperor, looking as fresh as he did nine years ago on the same ground, took the second prize; but we have described him so often, that he must be too well-known to bear repetition, and indeed it is time he retired from the field to rest upon his many laurels. Mr. Toller's three-year-old Ploughboy, and Mr. Green's Prince were but average animals, and the less said about the prize two-year-old of Mr. Hodgson the better. Mr. Charles Fort's second-prize was one of a better sort, and will beat his victor to-day with a little time. Mr. Ward, of East Mersea, showed a splendid mare and foal, Brock, that well deserved her first place, but Sir Edward Kerrison had a hardish fight for the "second," and the popular opinion went with Mr. Francis's mare, and with one belonging to Mr. Capon's executors, whose foal carried off the first prize in its class, and was a long way ahead of the second, Mr. Waite's is a very ordinary foal indeed, but neither of the foals looked like growing into such mares as they stood by the side of. Mr. Walton's old grizzly dark chestnut, having of late given up her maternal duties, came in first in the "gast" mares, as she did in Norfolk, and a fine lengthy deep heavy mare she is, though not quite the Suffolk type. Mr. Tomlin's five-year-old, the only one he ever shows, was second. Sir Thomas Lennard showed a good level three-year-old filly, and took first honours; but it was very doubtful if Mr. Ward should have been second. Sir Edward Kerrison's two-year-old second-prize filly we thought the best in her class, but there was no rising star amongst the remainder. Of the yearlings, those the judges picked out for prizes did not appear to be the best. Mr. Rist won again with a rare sort of cart gelding, and Mr. Cornell had the best of any age, but the class only comprised a trio, the winner being more hairy about the legs than we fancy they like in Suffolk. The Ipswich Cups of course went to the winners in the previous classes. On the whole, the show of Suffolks was perhaps an average one, but there was an absence of any new and shining light; and too much fat and

too little action appears still far too often the order of the day.

It was a source of satisfaction to find that the prevailing defects and unsoundnesses that were so rife but a few years ago with Suffolk horses were most sensibly diminishing. The shelly, brittle feet, and in many instances the tendency to contraction, that used to be so frequently met with in this very useful class, are on the wane. No doubt a deal of this is attributable to the veterinary supervision that was originally introduced by the Royal Agricultural Society, with the view of checking the indiscriminate use of animals for breeding purposes possessing hereditary diseases. The value of this proceeding is being recognised by other societies, and there is hardly one of importance now without its duly-appointed inspector. The judges remarked the change that had taken place for the better in some other points: the hocks were getting longer and flatter; with an absence of bursal enlargements in the shape of thorough pins and bog spavins, and the forelegs not so round, the joints cleaner, and the knees better than they were. In corroboration of this, it was allowed that the two years old class was a great advance, and that the yearlings were even more promising than the two-year-olds.

The show of Suffolk cattle was very good, and certainly this description of stock has much improved within the last few years. We, however, had thought that the appearance of "alugs" was to be considered a disqualification; nevertheless the second-prize bull had them, most unmistakably; and we could not understand why, independently of the "alugs," he should be preferred to Sir E. Kerrison's Eclipse—a winner on several other occasions; and that although perhaps a little light in the middle, possesses many points that it would be well for the breeders of these cattle to cultivate and improve. Mr. Arthur Crisp's first-prize bull was a thick, heavy, good beast. Ten yearling bulls were entered in the next class, amongst them several improving animals; but a yearling Suffolk bull is anything but a handsome animal. The cows mustered in great force; the special prize, given by the town of Ipswich, for the best dairy of not less than four Suffolk cows, being a great inducement to breeders to try their strength; and although Mr. Wolton's Rosemary again carried off the Society's prize, and was, moreover, well backed up, still Sir E. Kerrison's dairy of 10 cows were too full of merit, and the Cup goes to that gentleman, who has done so much to improve the breed of the cattle and general stock of the country. The classes for two-year-old and yearling heifers were well-filled; as some of the young ones promise well for going on. We are sorry we cannot say as much for the Shorthorns as we can for the Suffolk cattle. There were certainly some few good ones shown, but on the whole this was the weak point of the show. The fact of Mr. Crisp not appearing as an exhibitor in any of the classes will somewhat account for this sad falling-off; but evidently Shorthorns are not appreciated in Suffolk. How it is we cannot of course tell; but in almost any little district meeting in any other county a better entry would have been found. Lady Pigot's Ravenshope is a promising young one, with beautiful hair and quality; Sir E. Kerrison's Violet 8rd, who last year was looked upon as not a breeder, has proved herself to be so, and is grown into a fine massive cow of good quality; while Mr. Frere (of Roydon Hall), exhibited some of the late Jonas Webb's breeding, and Mr. Wilson some bred by Lord Braybrooke. Lady Pigot's Queen of Roseley is a very nice one, but how she could be called a yearling on the 80th of June when she is entered as calved July 5th, 1864, we are at a loss to understand: she was however, awarded the prize as the best one-year-old heifer. A good Shorthorn fat ox was shown by Mr. Upson, and a very plain one by the Marquis of Bristol.

The entries of sheep showed an increase of about thirty as compared with that of last year; and when it is known that Sir Thomas Lennard, Mr. Hugh Aylmer, Mr. Sexton, Mr. Brown, and others were exhibitors, it will readily be believed that some splendid specimens of their respective breeds were brought forward for inspection. The Norwich verdict as regards the tups of Mr. Brown and Mr. Aylmer was upset; as it would appear that the Brentwood sheep, so much admired there, has suffered a good deal from the knocking about at the three shows, and this is not at all to be wondered at, considering the extraordinary state of obesity to which it is thought necessary for animals now to attain, to entitle them to favour in the eye of the public. Sir Thomas Lennard's Down rams were very handsome, as were Mr. Tomline's shearing ewes, whilst Mr. Hempson exhibited some very useful ones, but the Marquis of Bristol's ewes appeared to have suffered from the dry season and shortness of food. As usual, Mr. Dobito ran away with all the prizes for the blackfaced breed, of which he is so fond, and Mr. Rigden dislikes so much; and it is to be hoped that the owner of the solitary pen of shearing ewes of that breed was present, to compare his entry with the handsome lot of shearing Down ewes in the adjoining pen. There were no long-wool ewes or wethers shown for the premiums offered, but Mr. M. Biddell sent a pen of Down wethers that were much admired. Mr. M. Sexton's twenty Cotswold ewe lambs were preferred to Mr. Tomline's Downs, as wool and mutton must now carry the day.

There were 72 pigs shown, as against 45 last year. We do not know whether it be possible that the quality has improved as much as the number of entries, but the show of pigs was certainly a wonderful one, and we did not envy the judges their task. Fortunately the day was cool, otherwise it would have been a most arduous and not very agreeable task to have to adjudicate upon animals so near perfection as many of them were. Mr. M. Sexton took the lion's share of the prizes, with some animals rejoicing in very sporting-like names, and we shall be surprised if we have not to record the success of several of them at the forthcoming show at Plymouth. Mr. Stearn was, as usual, in full force with a capital lot of pigs; and Mr. Wolton and Mr. Sawyer contributed to make up one of the best shows of pigs ever seen in any county show.

The show of implements was large—larger in fact than at any meeting, with the exception of that at Ipswich two years since. The exhibitors were F. Beaumont and Co., sack and cloth manufacturers, Ipswich; Mrs. Bennett, 131, Fore-street, St. Clement's, Ipswich; E. H. Bental, Heybridge, Maldon, Essex; R. Boby, Bury St. Edmunds; T. Bradford and Co., Cathedral Steps, Manchester, and 63, Fleet-street, London; C. Burrell, Thetford; A. and W. Eddington, Chelmsford (agents at that point for Clayton, Shuttleworth, and Co.); R. Garrett and Son, Leiston; W. Harwood, London; F. Mason, Ipswich; C. J. Meadows, ironmonger, Ipswich; W. Ney, Bramfield, near Saxmundham; W. and G. Rands, Upper Brook-street, Ipswich; Ransomes and Sims, Orwell Works, Ipswich; Riches and Watt's, Duke's Palace Iron Works, Norwich; Samuelson and Co., Britannia Works, Banbury; T. Smith, Vulcan Works, Ipswich; Joshua Smyth, Sweffing, Saxmundham, Suffolk; J. Smyth and Sons, Peasenhall, Suffolk; Witham, Essex, and Dieppe, France; E. R. and F. Turner, Ipswich; Ward and Silver, Melford, Suffolk; Wheeler and Wilson, 189, Regent-street; W. P. Wilkins, Ipswich; Woods and Cock-seidge, Stowmarket, Bury St. Edmunds, and Colchester; and A. Wrinch, ironmonger, Ipswich. Messrs. Eddington exhibited a 10-horse power double-cylinder traction engine by Clayton, Shuttleworth, and Co. The most important feature in this engine was what is termed the "improved patent compensating intermediate motion," which is self-acting, and enables the driving-wheels to accommodate themselves to the sharpest curves without strain or loss of power; both wheels are at the same time kept in gear, and receive the full power from

the engine. Messrs. Riches and Watts exhibited their improved "Eureka" corn-grinding mill, for steam or horse power, which was awarded a special medal at the Norwich show. In this mill there is a new arrangement of the grinding surfaces by which the fineness of the grist is regulated by an eadker movement of the grinding roll, an arrangement which is contended effectually prevents any corn from passing partially ground; it is adapted also for kibbling corn or splitting beans. No prizes of any kind were awarded for implements.

The dinner, which took place in the Corn-Exchange, was rather thinly attended. Lord Stradbroke having a weak chest was unable to fill the chair which he has occupied so well for so many years; and Sir E. Kerrison was also suffering from an attack of gout. The Duke of Grafton came to the rescue, but was obliged to leave at an early hour to catch an up-train for town. On the departure of his Grace, Sir Charles Russell was "sent for," and responded manfully to the call. The vice-chair was taken by Mr. J. C. Cobbold, M.P. Lord Henniker, who spoke against time, in his resolute exertions to escape also by the train which conveyed to London the Duke of Grafton, observed, in responding for the county members, that he thought the country gentlemen of England had been much maligned on the subject of cottage accommodation. He knew that in Suffolk the greatest attention had been paid to the cottages, at least in every parish with which he was acquainted. He knew of one instance in which cottages had been built expressly for the accommodation of families in which the parties for whom they were erected begged and entreated to be allowed to remain in their old insufficient dwellings, because they had lived in them all their lives and their fathers before them. Sir F. Kelly said he could hardly congratulate farmers upon their position with wheat at 40s. to 42s. per qr. with the risks and troubles to which they were subject, and the unfair restrictions imposed upon the cultivation of the land by the malt-tax. This latter allusion was received with loud cheers and a few hisses. The hon. and learned gentleman, after a passing allusion to the pre-eminence attained by Suffolk in the manufacture of agricultural implements, referred to the question of the utilization of town sewage. [Nothing appears to change in Suffolk, we may parenthetically observe. For the last six years at least Sir Fitzroy has trotted out every year these old hobbies, and they are always well received on making their appearance.] The subject of sewage, Sir Fitzroy observed—after making his usual joke about the difficulty in dealing with so nasty a subject after dinner—had lately been deeply impressed upon the public mind, by improvements introduced in connection with the removal of the sewage of the metropolis. In consequence of these improvements the sewage of London had acquired, it was believed, an integral value of some £2,000,000 per annum; and if means could be devised by which the entire sewage of England could be saved and prevented from poisoning our beautiful rivers, it would be worth £16,000,000 per annum, and would add ultimately to the produce of the land. The subject was deserving of the consideration of the society, and he hoped Mr. Bond would allow him to enter into communication with him upon the matter, so that some means might be devised for assisting in Suffolk the movement for the utilization of sewage. These remarks called for the hearty expression of approval from Mr. Grimwade, who, in proposing the implement exhibitors, observed, amidst great laughter, that the population of Ipswich produced a capital sewage—better than any artificial manure—but the difficulty was to get it on to the land; another difficulty was, that great authorities, such as Liebig and Voelcker, were divided in opinion as to the results of sewage. After a great number of complimentary speeches, and a general expression of hope that all differences of opinion as to the selection of Bury for the meeting of the Royal Agricultural Society would be forgotten, and that all Suffolk men would feel it a point of honour to carry the meeting through satisfactorily, Mr. Dobito replied for the successful exhibitors, and observed, with regard to "the Suffolk" sheep, that every one must see that they are better than they formerly did. The horse, with which he was delighted to have beaten his friend Capt. Barlow, had carried him, weighing as he did 17½ stone, all through the winter. Mr. Cross replied for the judges, and, referring to the cart-horse stock, said he was pleased to find the yearlings superior to what had been witnessed for several years. The last year



were very good; but the mares and foals, either owing to the dry season, or some other cause, were scarcely represented so well. Mr. Overman also replied, and said he must compliment the meeting upon the show of Suffolk cattle. He wished he could do so also as to the shorthorns; but when he looked at the catalogue, he was not surprised that the show was weak here, for the premiums were abominably small, and shorthorn men would not come out for them. He would suggest that more money should be given in premiums, and also that covered sheds should be provided, without which shorthorn men would never bring valuable animals to the show. Capt. J. B. Booth returned thanks, as a judge of riding horses, and said some very good animals had come under his notice during the day. He lived in a district where one of the best riding-horses were produced—that of Cleveland; and living as he did a good deal among horse-flesh, he could speak with confidence when he said that if they only sent in Suffolk improving their brood mares, and putting them to such horses as had been shown in the ring that day, they would do very well. If they did not keep up good mares they would never have paying produce, and if they could not find horses to pay, what was the use of them? There was no better paying business in farming just now than breeding good horses, for never where they so scarce as they were at present. In Yorkshire, he knew that at the present time, if he wanted a number of good hunting colts, he should have to ride six miles before he could get them, because during the last five or six years our friends the foreigners had taken off all our best mares into France and Belgium. When a farmer got a good mare he should stick to her, and put her to the best horse which could be produced. Such a mare ought not to be served with a horse for which only a sovereign was paid, for it would be cheaper to pay ten guineas or five guineas for a really good one. Mr. Turner, as a judge of sheep and pigs, said there were some good sheep and some very bad ones. Unless the owner of one lot—whom he did not know personally—could buy better animals, he had better keep them at home. With regard to the pigs, the case was very different: they were so good, that the judges had great difficulty in awarding the prizes. In conclusion—Mr. Turner, whose outspoken remarks excited considerable merriment, said he was happy to say that he had obtained “the promise of a ride from a ram which had been exhibited during the day.” Mr. J. H. Hedge, in replying to the stewards of the yard, took exception to the remarks of Mr. Overman as to shedding, which he considered prevented animals from being seen fully. Mr. Hedge suggested the union of the Norfolk, Suffolk, and Essex societies into one pet association, with a three days’ meeting. Mr. Bond, the secretary, in returning thanks for the well merited compliment of his health, touched upon the same subject. The party shortly afterwards broke up.

## PRIZE LIST.

### AGRICULTURAL HORSES.

JUDGES.—J. B. Cooper, Blyborough.  
H. Croese, Stowmarket.  
R. Winch, Harkstead.

Stallions having served not less than twenty mares in Suffolk.—Prize of £10, and prize of £5 as the breeder, to J. E. Tattingstone (Harwich Emperor); second of £5, to G. B. Badham (Chester Emperor).

Three-year-old entire cart colts.—Prize of £8 to W. Toller, Edgrave (Ploughboy); second of £5, to B. P. Green, Blakenham (Prince); third of £4, not awarded.

Two-year-old entire cart colts.—Prize of £8 to E. G. Hodgkin, Charsfield Hall; second of £4, to C. Frost, Wherstead; third of £3, not awarded.

Year-old entire cart colts.—Prize of £5 to S. Wolton, jun., Edgrave (Monarch); second of £3, to W. Wilson, Baylham Hall.

Cart mares, with foals at foot.—Prize of £8 to J. Ward, East Mersea (Brock); second of £4, to Sir E. C. Kerrison, (Lady Jane).

Cart foals (foaled in 1865).—Prize of £5 to the Executors of the late T. Capon, Dennington; second of £3, to J. N. Waite, Marham Hall.

Best cart mares.—Prize of £8 to S. Wolton, Newbourn (Maggie); second of £4, to G. Tomline, M.P., Orwell Park (Daisy). Commended: A. Brewer, Debenham; the Marquis of Bristol; C. K. Cordy, Trimley; J. A. Hampson, Erwarton Hall; and C. Frost, Wherstead.

Three-year-old cart fillies.—Prize of £8 to Sir T. B. Lennard, Belhus; second of £4, to J. Ward, East Mersea.

Two-year-old cart fillies.—Prize of £8 to W. Stearn, Elmsett (Diamond); second of £3, to Sir E. C. Kerrison.

One-year-old cart fillies.—Prize of £4 to Sir E. C. Kerrison; second of £3, to Sir T. B. Lennard. Highly commended: S. Wolton, jun. Commended: R. Walker, Chelmsdistant; and C. Frost, Wherstead.

Three-year-old cart geldings.—Prize of £3 to J. Rist (Prince).

Four-year-old cart geldings.—Prize not awarded.

Cart geldings of any age.—Prize of £4 to W. Cornell, Holbrook (Captain). Commended: W. Cornell (Jolly).

### RIDING AND COACHING HORSES.

JUDGES.—G. Appleton, Thornton Heath, Croydon.  
Capt. J. B. Booth, Killerby Hall, Catterick.  
H. Thurnall, Royston.

Thoroughbred stallions for hunting purposes, having served not less than ten mares in Suffolk.—Prize of £10 to G. Dobito, Lydgate (Vir); second of £5, to Captain Barlow, Hasketon (The Ace of Clubs). Highly commended: Captain Barlow (Elmsdale).

Stallions for coaching purposes, having served not less than ten mares in Suffolk.—Prize of £10 to R. J. Cooper, Blythburgh Lodge (Sensation); second of £5, to R. J. Cooper (Cavalier).

Cob stallions, not thoroughbred, fourteen hands and not exceeding fifteen hands.—Prize of £5 to Captain Barlow (Evening Star). Highly commended: S. A. Goodwyn, Leiston Hall (Sultan).

Hunting mares with foals.—Prize of £5 to W. B. Long, Woodbridge (Rejected).

Coaching mares with foals.—Prize of £5 to T. Easterson, Bawdsey (Rainbow).

Cob mares, fourteen hands and not exceeding fifteen hands, with or without foals, not thoroughbred.—Prize of £4 to J. Grout, Woodbridge. Highly commended: Captain Barlow (Gipsy).

Hunting foals.—Prize of £4 to M. Mumford, Creeting.

Coaching foals.—Prize of £4 to T. Easterson, Bawdsey.

Roadster foals.—Prize of £4 to R. J. Cooper, Blythburgh Lodge. Commended: Captain Barlow.

Three-year-old weight-carrying mares or geldings for hunting purposes.—Prize of £4 to N. Welton, Bradfield. Highly commended: M. Mumford, Creeting.

Three-year-old mares or geldings for coaching purposes.—Prize of £4, not awarded.

Three-year-old roadster mares or geldings.—Prize of £4 to H. Biddell, Playford.

Two-year-old mares or geldings for hunting purposes.—Prize of £4 to M. Mumford, Creeting (Spot). Highly commended: R. J. Cooper, Blythburgh Lodge (Cinderella).

Two-year-old mares or geldings for coaching purposes.—Prize of £4 to G. Gooderham, jun., Monenden (Kate).

Two-year-old roadster mares or geldings.—Prize of £4 to R. J. Cooper (Dandy Jim).

Hackney mares or geldings under seven years old.—Prize of £5 to J. Grout, Woodbridge (Norfolk); second of £3, to E. Greene, Bury St. Edmund's.

Hunting mares or geldings not exceeding seven years old, by a thoroughbred horse.—Prize of £5 to J. Grout, Woodbridge (Kingston); second of £3, to G. Sexton, Wherstead.

Coaching mares or geldings not exceeding seven years old.—Prize of £5 to J. Grout, Woodbridge. Highly commended: T. Easterson, Bawdsey (Young Ferrand).

Ponies not exceeding thirteen-and-a-half hands and not under twelve hands.—Prize of £3 to J. A. Ransome (gelding, Sprite); second of £1, to J. A. Ransome (mare, Fairy). Highly commended: S. Peck, Eye (Peacock).

### CATTLE.

JUDGES.—E. Frost, West Wrattling.  
H. Overman, Wessingham.

Suffolk bulls not under two years old.—Prize of £8 to A. W. Crisp, Chillesford (Prince); second of £3, to Sir W. Jones. Commended: Sir E. C. Kerrison (Eclipse).

Suffolk bulls under two years old.—Prize of £4 to Sir E. C. Kerrison (Hero); second of £2, to Sir W. Jones. Commended: Sir E. C. Kerrison (Colonel).

Suffolk cows in-milk or in-calf.—Prize of £5 to S. Wolton, Newbourn (Favourite); second of £3, to Sir W. Jones. Highly commended: Sir E. C. Kerrison (Violet). Commended: A. W. Crisp, Chillesford.

Three-year-old Suffolk heifers in-milk or in-calf.—Prize of £4 to G. Tomline, M.P.; second of £3, to Sir E. C. Kerrison (Cowslip).

Two-year-old Suffolk heifers in-milk or in-calf.—Prize of £4 to Sir W. Jones; second of £2, to G. Tomline, M.P.

One-year-old Suffolk heifers.—Prize of £3 to Sir W. Jones; second of £1, to A. W. Crisp, Chillesford. The class generally commended.

Bulls of any other breed (not Suffolk) not under two years old.—Prize of £8 to G. E. Frere, Baydon Hall (red Shorthorn, Tally Ho); second of £3, to Sir E. C. Kerrison (roan Shorthorn, Lord Brome).



Bulls of any other breed (not Suffolk) under two years old.—Prize of £4 to H. Wilson, Stowlangtoft Hall (white Shorthorn (Volunteer); second of £2, to Lady Pigot (rich roan Shorthorn, Ravenshoepe).

Cows of any other breed (not Suffolk) in-milk or in-calf.—Prize of £5 to Sir E. C. Kerrison (roan Shorthorn, Violet 3rd); second of £2, to J. R. Chaplin, Ridgwell (roan, Jessie).

Three-year-old heifers of any other breed (not Suffolk) in-milk or in-calf.—Prizes not awarded.

Two-year-old heifers of any other breed (not Suffolk) in-milk or in-calf.—Prize of £4 to G. E. Frere, Raydon Hall (red Shorthorn, Duchess of Gloucester); second of £2, to J. R. Chaplin, Ridgwell (roan Shorthorn, Lady Western).

One-year-old heifers of any other breed (not Suffolk).—Prize of £3 to Lady Pigot (roan Shorthorn, Queen of Roselly); second of £1, to G. E. Frere, Raydon Hall (red and white Shorthorn, Beattie Tudor).

Fat oxen not exceeding three years old.—Prize of £3 to J. R. Upson, Witham.

Fat heifers not exceeding three years old.—Prize of £2 to W. Turlow, Hacheston.

### SHEEP.

Judges.—O. Hawkins, Lee Wick, St. Osyth.

T. H. Turner, Chington, Seaford.

Southdown tups of any age.—Prize of £6 to Sir T. B. Lennard.

Shearing Southdown tups.—Prize of £8, and second of £2, to Sir T. B. Lennard.

Tups of any age of the blackfaced breed now named the Suffolk.—Prize of £8 to G. Dobito, Lydgate.

Shearing tups of any age of the blackfaced breed now known as the Suffolk.—Prize of £8, and second of £2, to G. Dobito, Lydgate.

Long-woolled tups of any age.—Prize of £6 to T. Brown, Marham. *Highly commended:* H. Aylmer. *Commended:* T. Brown.

Shearing long-woolled tups of any age.—Prize of £6 to H. Aylmer; second of £2, to T. Brown. *Highly commended:* G. M. Sexton.

Southdown shearing ewes.—Prize of £6 to G. Tomline, M.P.; second of £2, to Sir W. Jones.

Shearing ewes of the blackfaced breed now known as the Suffolk.—Prizes of £6 and £2 not awarded.

Long-woolled shearing ewes.—*No entry.*  
Short-woolled shearing wethers.—Prize of £3 to M. Biddell, Playford.

Long-woolled shearing wethers.—Prize of £3 not awarded.  
Wether lambs of any breed.—Prizes of £4 and £2 not awarded.

Ewe lambs of any breed.—Prize of £4 to G. M. Sexton, Wharstead Hall; second of £2, to G. Tomline, M.P.

Extra Stock.—*Commended:* Twenty Cotswold ewes, shown by G. M. Sexton.

### PIGS.

Judges.—O. Hawkins.

T. H. Turner.

Boars of the black breed.—Prize of £5, and second of £2, to G. M. Sexton (Broadalbano and Gladiator). *Very highly commended:* G. M. Sexton (The Prince of Wales). *Commended:* G. M. Sexton (Christmas Carol).

Boars of the white breed.—Prize of £5 to G. M. Sexton; second of £3, to S. G. Stearn, Brandeston. *Very highly commended:* G. M. Sexton (First Fruits).

Sow and pigs of the black breed, the pigs not exceeding twelve weeks old.—Prize of £4, and second of £2, to S. G. Stearn, Brandeston.

Sow and pigs of the white breed, the pigs not exceeding twelve weeks old.—Prize of £4 to S. G. Stearn; second of £2, to J. Sawyer, Tunstall.

Breeding sows of the black breed.—Prize of £3 to G. M. Sexton; second of £2 to G. M. Sexton (Princess of Wales). *Highly commended:* S. G. Stearn.

Breeding sows of the white breed.—Prize of £3 to G. M. Sexton (White Duck); second of £2, to G. M. Sexton (Snowdrop). *Highly commended:* S. G. Stearn.

Three young sows of the black breed, pigged since Nov. 1.—Prize of £3 to S. G. Stearn.

Three young sows of the white breed, pigged since Nov. 1.—Prize of £3 to G. M. Sexton.

Extra Stock.—*Commended:* J. Sawyer, Tunstall (young Suffolk sows and young white boars).

### CHEESE AND BUTTER.

Judges.—J. Limmer, Ipswich.

S. Wainwright, Ipswich.

Suffolk Cheese.—Prizes of £3 and £2 to G. Keer, Tunstall.  
Suffolk butter.—Ipswich special prize of £3 3s., to A. J. Alexander, Westerfield; second of £2 3s., to Lady Caroline Kerrison. *Highly Commended:* M. Mumford, Creething; J. P. Budd, Wickham Market; H. Biddell, Playford; and G. Tomline, M.P. *Commended:* G. Sawyer, Thwaite.

### IPSWICH PRIZE CUPS.

Suffolk cart stallions, not less than three and not more than ten years old.—Cup of the value of £10 10s. to J. Bist, Tattingstone (Harwich Emperor).

Suffolk cart mares, not less than three and not more than ten years old.—Cup of the value of £10 10s. to S. Wolton, Newbourn (Moggy).

Teams of Suffolk cart-horses, geldings, or mares.—Cup of the value of £10 10s. to S. Wolton (four chestnut mares, Victoria, Matchet, Pride, Bonny).

Pairs of van horses.—Cup of the value of £8 8s. to W. Cornell, Holbrook (chestnut geldings, Captain and Jolly).

Pairs of match horses for carriage or phaeton.—Cup of the value of £10 10s. to J. Groult, Woodbridge.

Riding hackneys, geldings, or mares, between fourteen hands and fifteen-and-a-half hands, and between four and nine years of age, shown with bridle and saddle, mounted in all places.—Cup of the value of £10 10s. to J. Groult (chestnut trotting hack, Norfolk); second cup, of the value of £5 5s., to E. Greene, Bury St. Edmund's (chestnut hack).

Ponies, mares or geldings, not exceeding thirteen hands.—Cup of the value of £8 8s. to S. Crake Roper, Rougham Place. *Highly commended:* J. Sawyer, Tunstall.

Dairies of not less than four Suffolk cows in-milk or in-calf.—Cup of the value of £10 10s. to Sir E. C. Kerrison (Duchess of Suffolk, Cowslip, Duchess, Silena, Susannah, Violet, Lucy, and Mary).

Special prize for the best pony, mare or gelding, above twelve-and-a-half hands and under thirteen-and-a-half hands.—Cup of the value of £8 8s. to J. A. Ransome, Ipswich (bay gelding pony, Sprite). *Highly commended:* J. A. Ransome (bay mare pony, Fairy); and R. Cooke, Livermores (bay mare pony).

### THE GATHERING AT BOREHAM.

On Friday, June 23, there was an interesting little gathering of agriculturists and others at Boreham House, on a subject with which the locality is to some extent identified—that of the best and most rapid means of cutting and making hay. Sir John Tyrell's object on the present occasion was to show how, by the aid of modern appliances, the standing grass may be levelled, converted into hay, and secured in cocks against the coming storm, or ready for the waggon, almost entirely by machinery worked by intelligent and willing labourers, with a rapidity altogether unknown in the times when the scythe and the fork and the rake were the only tools thought of by the farmer in this department. There was a party of between forty and fifty, some of whom had come from a distance, and who evidently took much interest in the proceedings of the day.

The ground set apart for the experiments was on the south-west side of the park. The mowers at work were Wood's, under the superintendence of Mr. Pertwee, of Boreham, the agent for the district, and Burgess and Key's Combined. In Wood's a very useful improvement has been suggested. At the head of the cutter, where it is connected with the draught, a joint has been introduced so as to give a greater degree of freedom to it, and a small wheel being placed just in front of this joint, it adapts itself better to the nature of the ground, so as to clear the side of a stretch, for instance, and meet any unevenness. Two large spaces were set out for these mowers, so that they worked almost side by side—and the eye and the ear, even of those unaccustomed to agriculture, soon showed that Wood's was much the lightest implement; the horses evidently moved with greater ease, and thus got over the ground more rapidly. They both cut well, and closely even in this light crop. Burgess and Key's too took a rather wider cut, but there was considerable strain upon the horses; and we believe that most of those present anticipated the verdict of the Right Hon. Hamilton Nesbit and Mr. Charles Leigh, who were appointed as judges of the day. After these competitors had ceased working, the machine which has been in use at Boreham House for the last seven years, and has levelled at least a thousand acres of grass, was sent into the crop, and it showed there is good work yet in "the old 'un."

While the mowers were at work, the other operations of haying were going on hard by. The shaker was set to work and though one of the old sort, from which the blue and red paint has long since disappeared, it acted excellently. With a pair of lighter horses than are usually employed, it moved more rapidly—not, as it was observed, like a sluggish stream.

over a mill wheel, but flinging the grass up like a fountain. Next came the horse-rake, gathering the crop in rows; and then followed the cocking-rake, the invention of Sir John Tyrell himself—a simply made and easy working implement, which, clearing a space of seven, eight, or ten feet, according to the heaviness of the crop, rapidly tumbles the rows into cocks, which two men with forks rapidly shape and top off, and considerable time is saved when the carting process is going on or the storm is coming. A considerable breadth was thus put into cock in a space of time that would have rather surprised the steady-going methodical haymaker of forty years ago.

There was another machine connected with haymaking—an American invention and importation—lying in the field. It looked to us very much like the backbone of some large

skeleton picked up in the prairie; but it turned out that it was intended to gather the hay together somewhat after the fashion of Sir John Tyrell's rake. The experiments made with it were not, however, very promising; and we will back Boreham House against all Alabama for rapidly putting hay in cocks.

Those who know Sir John Tyrell, and his good old English hospitality, will be sure that those present were not permitted to depart hungry and thirsty. At the close of the proceedings the company found an elegant luncheon laid out under a marquee on the lawn, their wants being amply provided for under the superintendence of Mr. Archer, the faithful old butler at Boreham House for two-and-fifty years; and the cool claret-cup and the champagne were most welcome after the morning's work of the hay-field.—Abridged from the *Chelmsford Chronicle*.

## MIDLAND FARMERS' CLUB.

### THE SEWAGE OF TOWNS.

The adjourned meeting of the members of the Midland Farmers' Club was held on Thursday, June 15, at the Lecture Theatre of the Philosophical Institute, for the purpose of taking into consideration the papers read at the meeting on the last instant by Mr. Houghton and Mr. Bannehr. There was a large attendance, with Mr. R. C. Chawner in the chair.

Mr. J. KING, in opening the discussion, said he thought they were greatly indebted to Mr. Bannehr and Mr. Houghton for the attention they had given to that important question. There were two points for consideration in the question: the first was, that it was highly essential that the health of the inhabitants of towns should be protected; and the second, how the night-soil could be collected so as to be useful in the improvement of the soil. Many opinions had been advanced, and many plans had been tried, and though expensive they had proved satisfactory (Hear). One point to be considered was the various qualities emanating from different towns. Take Birmingham, for instance, where there were so many chemical acids, or pickles, or other poisonous things, together with the refuse from the dissolution of metals, which were emptied into the sewers. These destroyed the manurial deposits so much that the sewage at the mouth of the sewers was not only worthless but injurious, as it destroyed the fish for some miles down the river, and the herbage on the land over which it flowed. And if these deleterious poisons were not withheld, they might convert the whole valley of the Tame into a barren and irreclaimable waste. He quoted a portion of the remarks made by Mr. Houghton in his paper read at the last meeting. He (Mr. King) felt anxious to investigate the statement made by Mr. Houghton, to prove the value of the use of the sewage. He had, therefore, ascertained some facts from Mr. Bembridge, the occupier of the meadows spoken of, showing the amount of stock nothing like what Mr. Houghton had stated. They had only been on it sixteen days since last autumn. The meadows had since been saved for mowing, and would not average 10 cwt. of hay per acre, and that of inferior quality. As these meadows had been quoted to prove the value of Birmingham sewage, he should be glad to meet Mr. Houghton, the Chairman, and any other gentleman there, when he thought the destruction of those once valuable meadows would carry conviction that it was high time steps were taken to prevent further mischief; for to think of selling sewage which produced such injurious effects was altogether out of the question. In his opinion Mr. Bannehr's remarks merited consideration where he advises deodorization of night-soil with dried earth, and thereby prevent it going to waste in the sewers. The manurial, valuable as it might be, was only the minor question. It was the devising means to prevent the destructive ingredients before mentioned which was the great point in question, and he would beg most respectfully to draw the attention of the Mayor and Corporation to that important subject, and to take such immediate steps as would prevent further injury to the land adjoining the river Tame. He suggested that night-soil or other manurial deposits should be, as far as practicable, kept out of the sewers; and he would add that the original system of petties was sound in principle, but wanted improvement in

detail; for instead of these being bog-holes or cesspools, all water should be kept out, and the dry ashes from each dwelling put in continually. These would deodorize the night-soil and take up the urine, and thereby produce a large supply of valuable manure without any nuisance or annoyance. This could then be conveyed to any distance with one-third of the trouble it caused in a wet state. Perhaps he might be told that plan was too late; but if Bannehr was correct when he stated only about one-thirtieth part of the houses were provided with water-closets, there was ample room for experiment.

Mr. W. FOWLER, jun., said he had the misfortune to differ entirely from the opinions advanced by some of the speakers at the last meeting. He fully agreed in one opinion, however, in which they all seemed to concur, that the introduction of the water-closet system was a national misfortune. He doubted the practicability of any system of interception whatever, which should on the one hand effectually prevent the pollution of rivers, and at the same time economically and profitably utilize the whole manurial elements of the sewage of large towns. Any system which fell short of these requirements was not worthy of serious consideration. Mr. Bannehr's scheme was a mere manufacturing speculation, which might be attended with more or less successful pecuniary results, but which was entirely valueless as a means of purifying the rivers and rendering available the contents of the sewers of towns. Similar objections were apparent to Mr. Cheshire's mode. What Mr. Houghton's theory on the subject might be he had entirely failed to discover. His own belief was, that so long as the present system of sewage continues, no effectual mode of disposing of the sewage, so as to prevent the pollution of the rivers and at the same time utilize the manurial elements, is possible, excepting by means of irrigation. The whole philosophy of the question appeared to him to be embodied in the admirable report of the committee of which Lord Essex was chairman. (Mr. Fowler then read the report mentioned.) All experience and evidence had shown that sewage could not be advantageously applied, except upon lands specially laid out and devoted to the purpose. He feared that it must be admitted Birmingham was not so favourably situated in that respect as some other towns; nevertheless he believed it to be practicable to deal successfully even with the vast volume of sewage of Birmingham. With this view, however, it would be necessary to discard at once and for ever the magnificent ideas of prospective profit entertained by some members of the council, and endeavour to rest satisfied with the prospect of getting rid of the difficulties attending the present lamentable pollution of the river Tame at a small annual cost, or at best with only a limited amount of profit. Mr. Fowler then went on to speak, by way of comparison, of the case of Croydon, which he supposed might be considered one of the most successful instances of town sewage in the kingdom. He then proceeded to give a general description of the plan of operations adopted at Croydon, and the results. And he thought the only plan for Birmingham was to carry out the same plan as followed at Croydon on a much larger scale, and under much less favourable circumstances. The Corporation must possess

themselves, by compulsory purchase if necessary, of a large tract of land—probably not less than 1,000 acres—lay it out and adapt it specially for the purpose of utilizing the sewage after the manner pursued at Croydon, and he did not doubt the ultimate success of the operation. The sewage was now used with advantage at Nechells, not after dilution, but direct from the main sewer itself; and although he admitted the importance of keeping out all noxious elements as far as possible, still he contended that that fact alone was sufficient to confute all the arguments urged against the use of the sewage on account of its admixture with the refuse of manufactories in the town. In conclusion he moved the following amendment in the words of the report of Lord Essex's Committee:—"That the right way to dispose of town sewage is to apply it continuously to land, and it is only by such application that the pollution of rivers can be avoided."

Mr. T. B. WRIGHT seconded the amendment.

Mr. CHESHIRE then moved, as an amendment, "That this meeting is of opinion that any plan for utilizing the sewage of towns which does not embrace the interception of the sewage before it arrives at the main sewer will be a complete failure, whether viewed in an agricultural, commercial, or sanitary measure." Mr. Cheshire denied that 6-7ths of the value of sewage (as stated by Mr. Bannehr) was in the urine, and quoted Liebig and other authorities to substantiate his assertion, and argued that the solid matter was the important fertilizing matter. He then referred to the imperfections of the present sewage system, and to the great increase in the mortality of our towns, which he attributed not to the collection of urine in the sewers, but from the solid excrementitious matters. The consequence was that the inhabitants of towns were continually breathing the gases which arose from the sewers, known as sewer gas, from which more people died than from any other cause. Gastric fever was only a polite name for what ought to be called sewer-gas fever. The only way to deal with the question, either in a sanitary or agricultural point of view, was to deal with it at the starting point, and they could not fail. He contended that if it was intercepted at once, which could be done without any offence, inconvenience, or annoyance, they would get a manure for the farmer which could be sent anywhere, and that in an unlimited supply and of the first order.

Mr. BROWN said they heard great complaints on all sides about the price of butcher's meat, and he thought that that question was intimately mixed up with the question of sewage. They were told that they ought to rear more calves; but he would venture to say there were very few farmers but had more calves than comfort last year. They devoured his turnips, a great portion of his corn, swallowed a great portion of purchased food, and very nearly swallowed the farmer himself. Now, by taking dry manure from the head of the sewers, not allowing it to enter at all, they would get a much more valuable and greater quantity of manure, which would benefit the agriculturists and the community generally. There was a great want in this country now of green food. They had corn cheap enough last winter, but cattle could not thrive on corn alone. He believed green food was their great want; and the solution of this question, in a great measure, would remove that want, and consequently reduce the price of meat. He begged to second Mr. Cheshire's amendment.

Mr. J. BALDWIN believed the right way to deal with the manure in towns was to stop it at the commencement: if not, it was diluted with such a quantity of water that it could not be very strong after. There was nothing so good as the plain simple old method of bog-holes; but the great fault of those generally, and especially in Birmingham was, that the refuse of the brewhouses ran into them, and there was no means taken to keep out the rain. His opinion was, that if they were properly constructed to keep out all surface water, and let nothing but fine ashes (of which every person made about as much as would consume his slops) be thrown in, he believed all the sewage in Christendom would not surpass it for agricultural purposes. The ashes did away with all smell, inconvenience, and slops. The mere water farmers threw away from bog-holes cost them some £4,000 or £5,000 a-year. He thought if that plan was carried out it would be a great advantage to the farmers and the towns (Hear, hear).

Mr. G. C. ADKINS said he had put a load of the refuse filtered from the sewers upon some crops, and he had never seen better-looking crops than he had seen this year.

Mr. KING said that it might appear advantageous in the first year to use it: they might not discover it in the second year; but they would afterwards find an injury that was irrecoverable. Before 15 or 20 years had gone, he would hazard his reputation that the land would be barren if the sewage were put upon it as it came from the sewers. He spoke from experience.

Mr. RICHARD FOWLER said for 18 or 20 years he had applied the sewage of Birmingham, and when properly applied he had found the greatest benefit from its use. He had as good crops this season as ever he had in his life. He thought it of the greatest value to farmers. As to the utility of intercepting a few water-closets, he thought it was something like looking for a needle in a bottle of hay.

Mr. HENRY OSBORNE was of opinion that if the system of intercepting could be carried out, it would be far better for the towns and the country. With regard to sewage water, he thought that many of their friends laboured under a mistake in thinking it contained a strong manurial element. There had been many analyses, and chemists differed in opinion as to its value. They did not only get the water that ran from the water-closets and other places and the sewage, but an immense quantity flowed from the springs in the towns; and they knew that the sewage might be so far diluted that it would take more from the land than it brought upon it. He did not think the towns could expect the farmers were bound to assist them in getting rid of a nuisance. He thought Mr. Cheshire's plan of interception a step in the right direction.

The CHAIRMAN proposed that the sewage should be turned through an extent of land, only to be used by those who were willing to use it till it was all absorbed in the soil. He looked upon it as worthless, and instead of the farmers paying anything for it, the people of towns ought to be grateful to get rid of a great nuisance.

Mr. FOWLER observed that there were times when he would not apply the Birmingham sewage to his land for £5 an acre. Those times would only be found out by experience. They knew it by its colour and other signs.

The meeting was then adjourned till that day fortnight, when Mr. Bannehr and Mr. Houghton will reply.

The adjourned meeting of the members of the Midland Farmers' Club, for the purpose of terminating the discussion on the sewage question, was held in the Lecture Theatre of the Philosophical Institution, Birmingham, on Thursday, June 29, Mr. G. C. Adkins, Vice-President of the Club, occupying the chair.

The Secretary read a communication from Mr. SAMUEL BATE, estate agent, Newcastle-under-Lyme, who said:

The discussion of the sewage question by the Club, and evidence given before the select committee of the House of Commons on Sewage, in 1864, confirmed him in the opinion he had long held, that the sewage system, which happily had been only partially introduced, was most wasteful and objectionable in every point of view. To form a correct opinion upon it, the value of the fertilizing ingredients of sewage, and the results of sewage irrigation, must be clearly understood and well considered with reference to such value and results. He would briefly state those as given in the evidence of Mr. Lawes, before the Committee, and confirmed by Professor Way and other competent witnesses. Mr. Lawes stated that "the sewage of Rugby was about 60 tons per head per annum, and that of London about 100 tons. That at Rugby 'the fertilizing ingredients, if taken out dry and packed in bags, would be worth 1½d. per ton of sewage, which is 7s. 6d. per head per annum. This sewage he has applied by open irrigation to grass lands. The land in its unmanured state produces 9 tons of green grass per acre; with 3,000 tons of sewage it gave 22 tons; with 6,000 tons of sewage 30 tons; and with 9,000 tons of sewage 32 tons. He did not try a smaller quantity than 3,000 tons." If they deducted the natural produce from the quantities stated, they found that the 3,000 tons of sewage produced an increase of produce of 13 tons, the 6,000 of 21 tons, and the 9,000 of 23 tons. The value of sewage applied, or rather of the fertilizing ingredients therein, being, for the 3,000 tons, £18 15s., equal to £1 8s. 10d. per ton of extra produce; for the 6,000 tons £21, equal to £1 15s. 8½d. per ton for the extra produce, and for the 9,000 tons £23, equal to £2 8s. 11d. per ton for the extra produce. These figures show, conclusively, that sewage irrigation is most wasteful of

manure, as applied at Rugby by Mr. Lawes, who is a member of the sewage commission, and made the experiment for the Government. Croydon had been mentioned by Mr. Fowler as "one of the most successful instances of the utilization of town sewage in the kingdom." The nature and inclination of the land were stated to be peculiarly favourable. The population of Croydon is from 17,000 to 20,000—the sewage of excellent quality; and from 4,000 to 5,000 tons of it were applied to the farm annually per acre. Take the quantity as 4,500, at 1½d. per ton, the value per acre is £28, and for the whole farm £7,000 per annum. What was the result of this large expenditure? A profit of £250 per annum. It was proposed that the sewage of Birmingham should be applied to 1,000 acres of land to be purchased and specially appropriated to the purpose. The population was 300,000. The quantity of sewage, at 60 tons per individual, was 18,000,000 tons; and at 1½d. per ton, the value would be £112,500. Comment upon these facts and figures was needless; but it might, perhaps, be said that the estimates were preposterous, and that the produce raised was the true test and criterion of the value of the ingredients in the sewage. This was entirely fallacious. The manurial elements were mostly in solution, the proportions being about 6-7ths in solution and 1-7th in suspension, and the whole so much diluted that the soil and plants to which the sewage was applied could not extract and assimilate them. The suspended matter might be extracted, as at Croydon, during dry weather, or a moderate rainfall; but much of what was in solution passed off with the water to the stream, and was lost, even under the most favourable circumstances. And that was not the only disadvantage of the sewage-irrigation system. The necessity for its constant application was a most serious difficulty, and was attended with immense loss and waste. Mr. Lawes said that, to a person obliged to take the sewage constantly, it was worth only 0½d. per ton; but, taking it when he might desire it, he would give 2d. per ton (a difference of 1½d. per ton), showing a loss, by constant irrigation, of three-fourths of the value of the sewage. There was, moreover, to be considered the difficulty of obtaining suitable land whereon to apply the sewage. Mr. Way said, in his evidence, "I could never get a clay soil open enough to receive sewage." Sandy soils were most suitable for the purpose; and these were not everywhere to be had, and scarcely anywhere conveniently and of sufficiently large areas for the complete utilization of sewage; and anything short of that must necessarily be attended with waste of what the country could not afford to lose, and the continued pollution of streams, which was so injurious and objectionable, and ought not any longer to be permitted. Mr. Rawlinson stated, in his evidence before the committee, with reference to the pollution of streams, that most of the rivers in Lancashire are "fouled almost from source to estuary," and their beds were raised in many instances nearly up to the arches of the bridges. He also said that "the river Tame, before it reaches Birmingham, receives the sewage of 270,000 people;" and that, in a sanitary point of view, "the town has been deteriorating since his inquiry in 1850." Mr. Cheshire described the sanitary condition of Birmingham now as far worse than it was before the sewerage was effected. It was clear, therefore, that there was nothing in the system which recommended it for more general adoption, but that, on the contrary, it required to be very considerably altered and amended, especially as by sewage irrigation was wasted upon grass lands what was so necessary to the arable farmer for the cheaper growth of corn crops, which at present were unremunerative. The important question, then, was—How was the alteration and amendment to be made so that there should be neither waste of valuable manure nor injury to health by foulness and offensive and poisonous exhalations? Both of those, he believed, to be practicable by the means suggested by Mr. Baunehr, or some similar ones. He (Mr. Bate) did not understand that he purposed to utilize the urine only, but the whole of the excreta. That was obviously necessary, and must be, if possible, effected. It was practicable only, he thought, by interception, deodorization, and collection in an undiluted state, and free from adulteration, except by the deodorants. A portion of the excreta might, when so collected, be at once carted, or sent by canals or railways to farms within moderate distances; and the remainder should be converted into a dry manure, which might be sent wherever required, to restore to the lands the elements which were yearly carried from them into towns in

the products which were there consumed. It might be objected that the expenses of this system would be too great for it to answer commercially, and that therefore it could not be adopted. If, however, it was considered that the pans and appliances would be much less costly than water-closets, that they could be easily kept in order, and be removed, emptied, and cleansed with facility, it would, he thought, be admitted that there should not be any difficulty in regard to expense. The night-soil, ashes, &c., of Manchester (where the old cesspit system remains) were collected at an annual cost of £20,000, the population being considerably upwards of 300,000 he believed, and therefore greater than that of Birmingham. Assuming that the cost of collection at Birmingham, under the proposed system, would be double that at Manchester, viz., £40,000—upwards of 2s. 6d. per individual—and that the value of the manure would be, according to the estimate before given, £112,500, giving a wide margin for other expenses and for contingencies; the sewage-water, when freed from excreta as proposed, would still be available and valuable for irrigation, provided Mr. Fowler's suggestion (which the legislature seemed likely to enforce, if practicable) that all "noxious ingredients" be kept out of the sewers, be acted upon. Everything of a fertilizing nature would thus be utilized, to the mutual advantage of the inhabitants of towns and country.

Mr. HOMER then moved, on behalf of Mr. Bate, the following amendment: "Having regard to the value of excrementitious and refuse vegetable and animal matter to be dealt with in towns, and to agricultural and sanitary exigencies, it is highly desirable that such matters should not be conducted into the public sewers, as they are made under the present sewage system, whereby injury to health and immense waste are occasioned; but that the same should be entirely intercepted, collected, and utilized, free from dilution or adulteration, except by deodorants of an unobjectionable character."

Mr. BANNER seconded the amendment.

Mr. JOHN LOWE considered a great mistake had been made in carrying water-closets into the sewers. It would, however, be practically impossible to disconnect them now, therefore the matter must be dealt with as it stood at present. He then referred to the value of night-soil from ash-pits, and remarked that from the increasing price the farmers were paying for it to the Corporation (they having raised it from 10 to 20 per cent.) it might be disposed of at some profit. He thought the Corporation would be lacking their duty if they did not prevent, as far as they could, the manufacturers from throwing their refuse into the sewers, such as vitriol, pickles, and other noxious and poisonous ingredients. He believed the system adopted at the outlet at Salitrey was the best that could be done under the circumstances, and farmers would come to know there was some value in the deposit intercepted there; and as to the liquid, he was entirely with his friend Mr. Fowler in believing they might do something with it—that there was a certain amount of quality in the sewage after it had gone through the interceptors, and that the time was not far distant when carriers of some description must be made use of, to carry this liquid into districts where it would be useful and beneficial to the farmers.

Mr. RICHARD FOWLER, jun., then moved the following as a separate resolution, and not as an amendment: "That the discharge of poisonous and injurious matters from gas, vitriol, chemical, metal, and other such like works and manufactories into town sewers is destructive of fertilizing matter comprised in town sewage, and in the rivers and streams into which the same flow, to an extent to become a question of national importance, calling for the immediate investigation of the Legislature, with a view to the enactment of more stringent and effective laws for the prevention thereof." He was sure from this town alone many thousands might be realised for the community in increasing the amount of food. That the ratepayers were to benefit by it was quite a mistake, and they might think themselves fortunate if they got rid of the sewage even at some considerable expense. He believed the tendency of public opinion was that the sewage matter from towns must be applied to land, and that it could be applied, he believed every one who had given it the slightest attention was fully convinced of; but what disappointed so many people was the discharge of the poisonous matter into the sewers, as there was no law sufficiently stringent to prevent it, and he had no doubt if the authorities of towns had authority to fix penalties it would cease. If that was kept out of the rivers and water,

the produce to be obtained from applying the water by irrigation would be doubled, and he did not think he should be far wrong if he said trebled in value.

Mr. MASON seconded the resolution.

Mr. HOUGHTON then rose to make his reply on the discussion. He said: Some rather sharp remarks had been made in—but more especially out of—the club, not so much on what he stated in his paper as what he omitted to state. Such strictures were hardly fair, because they left out of consideration the fact that he was limited to half an hour, and the introduction of the question was divided between him and another member of the club. He stated, when he made the application to the committee in the first instance, that the main object he had in view was to show, not merely that the various schemes for the utilization of sewage, in the expectation of recovering the value of the manure in it, had failed, but that (and he had supported it by reasons which he had not met with elsewhere) such schemes must necessarily fail, and that any plans of the town council based upon such a calculation must as a matter of course fail. After just hinting, when his time was up, at what he should do to meet the difficulty that was felt on the question, he left that part of it to Mr. Bannehr, acquainting him fully with what he intended to say; and if Mr. Bannehr's paper on the utilization of urine did not meet the Saltley difficulty to the satisfaction of those concerned, it was no fault of his (Mr. Houghton's). What were called the amendments of Mr. Fowler and Mr. Cheshire, were in reality no amendments at all to his resolution, but were consistent in all he had stated for the last four years, during which time the sewage fever had been at its height. As he understood it, Mr. Fowler's opinion was that two-thirds of the value of the Birmingham sewage was derived from the water. If from the remaining one-third he deducted the known value imparted by soapuds and house slops in increasing the temperature and forcing the grass for early spring feeding, only a miserable balance would remain for the value of the manure run into it. He would rather take the evidence of the same gentleman before the Parliamentary Committee, that there was no value at all—because it was given professionally, and was founded upon facts then stated, and agreed also with the experience of other places. The Mayor appeared still to cling to the exploded notion that the sewage derived its value entirely from the manure in it. It was very much to be regretted that this point was not set at rest by the Royal Commission and the Parliamentary Committees which had spent so much time on the question. After some further remarks on the subject, to the effect that the value of the manure in sewage was at best extremely small, he proceeded to the practical part of the question, viz., the remedy for the present state of things. This part of the subject divided itself into three heads, which were quite distinct:—1. The utilization of sewage for the purpose of clearing the river Thames of the foul matter which now polluted it; 2. The treatment of the manure for the purpose of freeing the sewers from matters injurious to the public health, and incidentally for the purpose of supplying farmers in the neighbourhood with manure of this description of an improved quality; and 3. The utilization of pure nightsoil and urine for the purpose of supplying farmers at a distance (where artificial manures were much needed) with a fertilizer capable of supplying the place of guano and of competing with it. If any grand plan for disposing of the question off-hand was expected of him, such an expectation would be disappointed. He did not believe in the practicability of anything of the sort. A system that had been acted upon for a quarter of a century, and under which habits and interests had grown up, could not be suddenly reversed, as some supposed. The principle of proceeding might be, but not the details. He should therefore take things as they now existed, and suggest improvements to be carried out as circumstances would admit. The nuisance at the sewage outlet at Saltley must be put a stop to, somehow or other. That it could not be much longer tolerated was evident from the communication read upon the subject by the Mayor to the Town Council at the last sitting. Even if all the manure could be intercepted at once, the sewage must still be dealt with. As an abstract question, and supposing a commencement *de novo*, no doubt the mud from the streets could be intercepted. The soapuds and house-refuse, and all other refuse, might be cleansed of their impurities, and the river-water made to run as clearly as it did years ago. But practically there were insurmountable

difficulties in the way. He should take it, therefore, for granted that the threatened injunctions of Mr. Adderley would not wait for any slow and costly reform of that sort, and that the nuisance at Saltley must be dealt with without delay. The question was, how? Subsidence, which had proved such a costly plying, would not do. It only removed the solid matter from one place, and created a nuisance in another, without cleansing the water. No mode of filtration by artificial means could be devised, that would effectually cure the evil. The natural purifier—the earth—afforded the only means of effecting that object. But, here, again, as there were seasons, during a great portion of the year, when farmers, or rather cow-keepers do not want the sewage, they could not be expected to put themselves to inconvenience and expense (and probably, as Mr. King suggested, loss), merely to get the Corporation out of a difficulty. This plan had to be tried at Croydon, and ended in getting the authorities there into still further litigation. The only alternative remaining was the proposed by Mr. Fowler, and which he (Mr. Houghton) had formerly suggested, as well in his first paper as in the local press, viz.: the taking land where the sewage might be applied at all times and at all seasons, that was continuously, for the purpose of cleansing the water before it passed into the river—not as a doubtful and hazardous experiment; for by the alternate course of irrigated Italian rye-grass and root crops, practised by Mr. Marriage at Croydon, it was conclusively shown that it could be done, the proof being that the injunctions still in existence were suspended and rendered nugatory by the abatement of the nuisance. The cost of doing it and the returns to be derived from it must be secondary considerations. As to the means, if the bill which had just passed both Houses of Parliament was any better than so much waste paper, the difficulty stated by the Mayor was met. Power was given to pass through lands, to acquire lands by rental or by purchase, and to let such lands, with the sewage, for a period not exceeding 25 years. The bill also provided the power of raising the money, the source from whence it was to be obtained, and the rate upon which the security was chargeable. It also gave the power of proceeding against adjoining districts for the abatement of nuisances which such districts might cause by fouling the water-courses. As to the second part of the question—the treatment of bogholes and water-closet manures, he expected there could be no question that every individual in the town had an equal right at common law, though he might not have equal power, that his neighbours should not make this matter a nuisance and injury to him, any more than the corporation might create a nuisance and an injury, without redress, to Mr. Adderley and others, by fouling their stream. At the end of his first paper he briefly alluded to a plan, adopted by Mr. Mason, of dealing with his foundry nuisance. The property was situated in a crowded part of the town, near St. Mary's Square. There was nothing unsightly to be seen, and no offensive smell. The bogholes were out of sight, being, in fact, under the washhouses and other buildings. The water was kept out. In a sanitary point of view the arrangement was complete, and the manure was rendered more valuable to farmers by the rain-water being kept out of it. He did not expect that Mr. Mason's plan could be enforced, but the principle of it might. There he had been anticipated by Mr. Councillor Baldwin, who proposed what it was his (Mr. Houghton's) intention to suggest—that the bogholes should be roofed over. He now came to the water-closets, and here again he contended that the inhabitants of the town had an undeniable right to be protected from nuisances created by their neighbours and townsmen. It was not simply that matters went into the sewers which, in certain conditions, and under certain atmospheric influences, bred disease; but that diseased matter itself from the bodies of persons suffering from various complaints was passed in likewise. This matter, whether diseased or not, ought to be arrested on the spot where it was produced, and rendered innocuous at the expense of these who produced it, on the same principle as any other general nuisance was dealt in. Mr. Bannehr did not propose, in his plan for utilizing urine, to deal with water-closets where they already existed; nor did he state what he would do with the present privies and ashpits, thereby passing by altogether (intentionally, it was stated) the local difficulties to be contended with. The same authority that had power to compel householders to drain their ashpits must have power to deal with what was a nuisance of far greater magnitude—the solid matter passing

into the sewers. The owners of water-closets ought to be compelled, within a reasonable time, at their own expense, to keep the solid matters out of the sewers, by Mr. Cheshire's plan or any plan they pleased. By these simple means, which were within the power of the Town Council, of improving upon existing arrangements without doing violence to private interests, Birmingham would be placed in advance of other towns in dealing with this difficult question; the river Tame would be cleared of its pollution; the sewers would be freed from matter injurious to the health of the inhabitants, and a better manure would be provided for farmers, and for which they could afford to pay a better price. We now come to the third division—"the utilization of pure nightsoil and urine for the purpose of providing farmers at a distance from towns with a fertilizer capable of supplying the place of guano, and of competing with it." This was the most important part of the question, because it was the national one. Agriculturists, especially in those parts of the country where artificial manures were and must be the forerunner and not the substitute of the dung-heap, had long been aware of its importance, and various attempts had been made to solve the problem, but hitherto without success. It was a question that legitimately concerned farmers' clubs, because it could be dealt with independently of town councils, the latter not being justified in dealing with it or delegating their power and authority to others to deal with it, until some plan was devised and successfully acted upon, and had gained the confidence and support of tenant-farmers from actual trial and well-directed and accurate experiments, affording proof that it would answer the purpose of towns to take it up. It might be commenced on a small scale in private establishments, such as that of the Mayor, to which he alluded in his first Paper, or it might be acted upon outside the jurisdiction of the town authorities. If all the manure of this description produced in Birmingham could be collected, this town possessed materials within itself for providing artificial manures sufficient for all the root-crops grown within the county, and then there was the additional quantity of equal or greater amount that might be obtained in the other towns and villages; so that Warwickshire, and counties like Warwickshire, or large centres of population, importing large quantities of food for their inhabitants, would be able to supply the purely agricultural counties which have surplus produce with the artificial manures they need, and which are now obtained from foreign sources at a great cost. He was aware that this statement was only a theory; but he firmly believed that it was capable of practical demonstration, and he was willing to try to give it a practical turn, if some competent authority were provided to test the manure produced, and give it a trial in competition with some of the most approved fertilizers at present in use. It would then acquire an authoritative reputation and a commercial value, and the means of collecting it would soon be discovered and made use of. He would therefore suggest that that council should take the matter up and use their influence with the council of the cattle-show to give a prize for a home-made manure of this description. Why not, as well as for roots? If it succeeded, every farmer would benefit by it, for he would discover that he possessed on his own premises the means of supplementing the artificial manures he at present purchased at great cost. The article produced by Mr. Bannehr or any other experimentalist might then be tested before capital was raised on schemes that must be doubtful until tested and tried. It was from beginning at the wrong end that undertakings such as that at Hyde had not succeeded; and the company there must have come to grief long ago, if it had not been that the urine in those parts had a special value for use in their local manufactures. This part of the question could not be taken by storm. Time was necessary for farmers to gain confidence in the article produced by repeated trials, and consequently the immense stock that would be on hand, and which towns were capable of producing, would bring any company to a stand-still that commenced dealing with it on a very large scale before the demand was created. *Plan summarised:* 1. He would take the sewage water, mud and all, to land on which it would be continually used for the express purpose of freeing the river Tame from pollution, doing away with the expense of the present subsidizing tanks at Saltley. 2. He would obtain such land as near to Saltley as possible, with a view of keeping down the expense of conveying the same, and also to keep the produce raised as near to the market for it as possible. 3. The quantity of land

to be kept as small as it could be consistently with effecting the object aimed at. Including some arable land, which must be had for the purpose of supplying the stock with winter food, the quantity would probably be altogether about 1,000 acres. The cost, at a rough guess, might be £150,000 or £160,000—£10,000 or £20,000 in excess of Mr. Walker's estimate. But there would be this great difference, that the greater part of the amount, instead of being spent in unproductive engine reservoirs, would consist of landed property, which would not depreciate but increase in value. As the council cannot turn farmers, and as the enterprise would be beyond the means of a single individual, the only mode of dealing with it would be by a company, on terms which would give the town an interest in the success of the scheme. With reference to the town, he would put in practice the powers possessed by the Borough Inspection Committee for the prevention of nuisances, and compel owners of property to abate the nuisance caused by privies, ashpits, and water-closets, within a specified time, in the manner already mentioned, if no better plan could be devised. This would give farmers a better manure, for which they could afford a better price. He would give every possible encouragement for the production of a dry, portable manure, meeting the requirement specified by the Royal Agricultural Society, as it is in this direction the means must be looked for by the town, of turning the balance, to managing this article, to the right side of the account. If no insurmountable difficulties stood in the way, it would be better that the whole business should be in the hand of the same authority, on terms to be agreed to, upon mutually advantageous terms to the town and the company.

Mr. BANNER then briefly replied. He argued that the plan carried out at Croydon could not be adopted at Birmingham. Mr. Fowler recommended that the Corporation should get 1,000 acres of land, to follow the example of Croydon. Now, if they calculated in the same proportion as to population, namely 60 persons to an acre, they would have to acquire 3,750 acres of land—

Mr. HOUGHTON: No, no.

Mr. BANNER: And as Mr. Fowler spent £9 10s. per acre in preparing land for the reception of sewage at Saltley, the whole outlay for the scheme would amount to nearly a million of money. Then they did not propose to improve the sanitary state of the towns: they would remain just as they were; and they would not improve agriculture generally, because it could only be applied in a limited extent, and in such a form agriculturists could not possibly use it. His own opinion was that the whole idea of sewage-irrigation was a fallacy, and if ever it was carried out to any extent, they would have to try back. He then referred to Mr. Cheshire's plan, and said that by it 5-8ths in value of the faecal matter was lost by passing away with the water. He also quoted statistics to show (in contradiction to Mr. Cheshire) that the main value was in the urine: 9-10ths or 4-5ths of the value remained in the liquid. The amount of ammonia in the urine compared with the ammonia in the faeces was as 150 in the urine against 30 in the solid matter. The question before them then was, Is the system of interception or of the old utilization of sewage the most desirable form of settling that much vexed question of sewage, or whether a combination of the two was the more advantageous way? He believed the dirty water from towns would have to be disposed of, even if the manurial matter be intercepted, as well as the refuse from manufactories also intercepted.

The original resolution of Mr. Houghton and the amendments were then put by the Chairman, and were all lost, with the exception of Mr. Cheshire's, which was carried by a considerable majority.

Mr. R. Fowler's resolution, seconded by Mr. Mason, was then put and carried, as was also Mr. Cheshire's amendment, which was put to the meeting in the shape of a substantive resolution.

Mr. Cheshire's amendment was as follows: "That this meeting is of opinion that any plan for the utilizing of sewage of towns which does not embrace the interception of sewage before it arrives at the main sewer will be a complete failure, whether viewed as an agricultural, a commercial, or a sanitary measure."

## THE HORSE SHOW

### AT THE AGRICULTURAL HALL.

Although the Dog-show may decline, and Islington hope again to enjoy a good night's rest, the success of the Horse-show continues, if anything, but a little too positive. It was commonly rumoured in the Hall on Friday that "the Royal hundred" had broken through for once, and that but a solitary thorough-bred stallion was entered for Plymouth. It will, of course, be something of a question how much or how little a meeting in London during the week previous may affect the great annual gathering, but for our own part we cannot but consider that one exhibition must, in some degree, tell upon the other, and that many a horse might have been in the West of England but for his other engagements in the North of London. Not, though, that the class of thorough-bred sires was by any means the strong point of the otherwise strong show for the next few days to be visited at the Agricultural Hall. On the contrary, there was some falling off both in numbers and merit; but twenty horses being nominated as against the forty-odd of last year; while the present entry was thus constituted, two of the competitors, Wallace and Costa, failing to put in appearance: Mr. Campbell Wyndham's Glenmasson, by Cothelstone out of Annette, by Priam, 11 yrs.; Mr. Meyrick's Idler, by The Flying Dutchman out of Urania, by Idle Boy, 8 yrs.; Mr. Baker's Somersault, by Voltigeur out of Golconda, by Birdcatcher, 7 yrs.; Mr. Casson's Motley, by Touchstone, dam by Lanercoast, 14 yrs.; Mr. H. Smith's Fulbeck, by Beverlac out of Elfrida, by Elis, 13 yrs.; Mr. Snewing's Caractacus, by Kingston out of Defenceless, by Defence, 6 yrs.; Mr. Goodchild's Diophantus, by Orlando out of Equation, by Emilius, 7 yrs.; Mr. Gulliver's Neville, by Napier out of Sally Snobs, by Sandbeck, 14 yrs.; Mr. Gulliver's Grimston, by Stockwell out of Miranda, by Lanercoast, 5 yrs.; Lord St. Vincent's Lord Clifden, by Newminster out of The Slabe, by Melbourne, 5 yrs.; Mr. Donald's Scottish Chief, by Lord of the Isles out of Miss Ann, by the Little Known, 4 yrs.; Mr. Johnstone's The Marionette, by Touchstone out of Marion, by St. Martin, 9 yrs.; Sir T. Barrett Lennard's Mainstone, by King Tom out of Blister, by Bay Middleton, 8 yrs.; Mr. Birkbeck's Marsh Heron, by Marsyas, dam by Heron, 3 yrs.; Messrs. Bailey's Rouge Dragon, by Windhound out of Paradigm, by Paragone, 7 yrs.; Mr. Hedley's Hetman, by Cossack out of The Queen, by Iago, 8 yrs.; Mr. Baker's Bonnifield, by West Australian out of Queen Mary, by Gladiator, 7 yrs.; Mr. Brigham's Snowden Dunhill, by Iago out of Daughter of Tosca, by Bay Middleton, 15 yrs. Amongst these will be found Caractacus, a winner of the Derby; Lord Clifden, a winner of the St. Leger; Scottish Chief, a winner of the Ascot Cup; Diophantus, a winner of the 2,000 gs. Stakes; Neville, a winner of the Royal Society's £100, with other well-known prize horses like Mainstone, Snowden Dunhill, Idler, and Motley. We shall leave our prize-list to tell its own story; but beyond the four distinguished, Mainstone, a much-improved horse of late, was also amongst the selected. Caractacus looked a deal the better for different reasons, having had much of his superfluous flesh removed since last season; but the Scottish Chief, just out of work, was as thin as a hurdle, and, despite his taking third place, with little business yet in a show ring. The second, Diophantus, who has grown somewhat coarser, is better

to get alongside of, than to see in the circle, and Motley, always a nice little nag, is wearing as fresh as ever; but Lord Clifden has gone wrong since a three-year-old, and showed very light and leggy; as there was nothing very particular amongst the others, with the exception of Snowden Dunhill, who might have justly come in for a share of the extra fifty which the judges distributed with so chary a hand. The coaching and roadster stallions, very injudiciously entered all together in one class, led to much but very necessary distinction, this work of separation being considerably increased by either description of animal being capitally represented. Of Mr. Holmes' young coach-horse we had to speak in very favourable terms when we saw him at Howden last autumn; and the best roadster, the Norfolk Quicksilver, also carries a verdict in his make and shape, let alone the style in which he can step out. We can but repeat there were a number of good horses in this mixed class, and the same return may be given of the hunters of five years old and upwards. Of these many previous prize takers—like the Tyke, first at Newcastle; Gayhurst, first the other day at Bedford; Spring of Nobility, well known in Ridings of Yorkshire, Mr. Grout's horses renowned in the East, and Mr. Gilford's in the Shires, here never caught the eye of the judges. These gentlemen, sorely put to it, separated the waiters from the light dragons as best they could, one of the most popular of their awards being Mr. Bennett's Lady Florence, a really sweet mare, though she was beaten off by Mr. Gilford's cheanut, unnoticed here, at Harboro' last summer. Lord Spencer's Brown Stout is also a very nice stamp of horse, though scarcely up to all the weight the prize list gives him credit for. The riding-horses curiously confused one with the other, as is the present fashion at Islington, brought some very familiar names and countenances to the fore. Old Crafty, from Cumberland, though she throws a foal season for season, goes as well as ever; and George Mulcaster, Mr. Percy's right-hand man, fairly threatens to rival old "Cuddy" in the Ring, for he wins with everything he brings out. Ingley, judiciously reduced a bit since he won at Hereford, was thought to be a long way the best four-year-old hunter; and Mr. Percy landed first again with Robin in a not otherwise very imposing class of "weight-carrying" cobs. The best weight-carrying riding-horse turned up in Carbine, that at the last show here was the prize charger, and who fairly rolled over when "proved" as a hunter on Saturday, at the bushed rail, or whatever they call it, which affords so much amusement, and offers so really little test of a horse's worth over a country. Turning to (C) in the schedule, the pick of the Park or Ladies' hacks, was declared to be Mr. Badham's grey, a nag that has hitherto not been quite so highly esteemed about the country, but which certainly looked and went wonderfully well, with the eyes of all England upon him. The carriage horses ran up to but a small entry, though Mr. Winbush's pair were very fine showy horses, Mr. Cottrill's wonderfully smart goers, and Mr. Branwhite's roans, just a useful pair to rattle about the country, but nothing extraordinary in the way of a prize match. The judges were also charitable enough to bestow a further premium at their disposal on a couple of things called Turkish Arabians, but whose actual merits were altogether beyond



common conception. Mr. Ransome's pair of ponies showed far better amongst the duodecimos, although they were a deal too fat to be seen to thorough advantage, and consequently others of less value got before them in certain single-handed battles, for which they were also entered. We have seen better ponies in shows of less extent, and were we to go merely by inches we should pick out the Haaketon cobs, which were clearly over-sized in the coaching class, and had thus their otherwise fine points overlooked. We must, however, by no means be understood as finding fault with the Judges, whose difficult duties were considerably increased from the way in which horses of different descriptions were from some inscrutable cause jumbled together in the same class. We are quite sure, from some experience in this kind of business, that it would work a deal better for all concerned—the management, the judges, the exhibitors, and the spectators—to have the conditions of each class clearly defined. If a man then wilfully chooses to put his horse in the wrong place, his sin must be on his own head. As it was, from the looking-on point of view, nobody at times seemed to know exactly where he was on Friday. Otherwise the direction was very creditable, the ring being kept tolerably clear of obtrusive swells, though they do love a live lord at Islington—as we suppose, indeed, an Englishman does all the world over!

### PRIZE LIST.

#### THOROUGH-BRED STALLIONS.

Judges.—Lord Chesterfield, Lord Falmouth, and Lord Portsmouth.

First prize of £100 in specie, with the Agricultural Hall Cup, value £25, to Mr. C. Snelling, Holywell, Watford ("arctacus"); second of £50 to Mr. H. Goodchild, Stud Farm, Enfield (Diophantus); third of £25 to Mr. W. Donald, East Acton (Scottish Chief); extra prize of £10 to Mr. J. Casson, Middleton Lodge, Uphall (Motley).

#### COACHING STALLIONS.

Judges.—Mr. Harvey Farquhar, Colonel Maude, and Captain Percy Williams.

First prize of £40 to Mr. G. Holmes, Newbigen, Beverley (Prince of Wales); second of £20 to Mr. W. Jackson, Wigginhall, St. Peter's, Lynn (Young Perfection).

#### ROADSTER STALLIONS.

Judges as for Coaching Stallions.

First prize of £40 to Mr. W. Jackson, Lynn (Quickliver); second of £20 to Mr. T. Phillippo, 57, London Wall (Young Performer); third of £10 to Mr. J. Gogge, Baddow Park, Chelmsford (Young Norfolk Phenomenon).

#### ALL-AGED HUNTERS.

Judges.—Lord Portsmouth, Lord Suffield, and Captain Percy Williams.

Five years old and upwards, equal to not less than 15st.—First prize of £20 to Lord Spencer, Althorp (Brown Stout); second of £20 to Mr. B. Goodlift, Jun., Stow-Weedon; third of £15 to Mr. Westley Richards, St. James's Place (Alphabet).

Five years old and upwards, with no conditions as to weight-carrying.—First prize of £20 to Mr. J. Ewins Bennett, Rushlands Bosworth, Rugby (Lady Florence); second of £20 to Sir G. Strickland, Boynton, York (Adonis). [There were in all 75 entries of weight-carrying hunters and others up to five years old, but these were not separated in the catalogue.]

#### FOUR-YEAR-OLD HUNTERS.

Judges.—Lord Chesterfield, Lord Suffield, and Captain Percy Williams.

First prize of £25 to Mr. H. J. Percy, Howsenrigg, Aspatria (Ingley); second of £20 to Mr. J. Musgrave, Pocklington (The Odd Number); third of £15 to Mr. W. H. Clark, Hook, Howden (Cotton Stockings); highly commended, Mr. J. Moffat, Kirklington, Carlisle (Yeoman); commended, Mr. J. Harradine, Haynes, Bedford (Pride of the Glen), and Mr. S. Gale, Kelmarsh (Caradoc).—[22 entries.]

#### CARRIAGE HORSES.

Judges.—Lord Chesterfield, Mr. Harvey Farquhar, and Colonel Maude.

Carriage Horses not under 15 hands 3 inches, in match pairs.—First prize of £20 to Messrs. Wimbush, Balkin-street

bays); second of £20 to Mr. Cottrill, Motcomb-street (chess-nuts).—[5 entries.]

Light Phaeton Horses, not exceeding 15 hands 1 inch, in match pairs.—[No entries.]

Harness Horses in extra class, in pairs.—First prize of £10 to Mr. F. Branwhite, Chapel House, Long Melford (roans); second of £5 to Mr. T. Honck, Tottenham (Turkish Arabs).—[4 entries.]

#### RIDING HORSES AND COBS.

Judges.—Mr. J. Beattie, Mr. Harvey Farquhar, and Colonel Maude.

Riding Horses not under 15 hands.—First prize of £25 to Mr. H. J. Percy, Aspatria (Crafty); second of £10 to Mr. W. Newton, East Aytton, York (Hawk).

Riding Horses equal to not less than 16st.—First prize of £25 to Captain Ferguson, Eaton Place (Carbine); second of £10 to Mr. C. Beart, Stow Bardolph, Downham (Princess).

Park Hacks, Ladies' Horses.—First prize of £25 to Mr. G. D. Badham, Bulmer's Tye, Sudbury (Major); second of £10 to Mr. E. A. Sotheman, The Cedars, Kennington (Tiny).

[There were in all 76 entries of riding horses, park hacks, and ladies' horses, but these were not separated in the catalogue.]

Cobs not exceeding 14 hands 2 inches.—First prize of £25 to Mr. H. J. Percy, Aspatria (Robin); second of £15 to Mr. James Russell, Petham Court, Eynsford; highly commended, Mr. J. Moss, Wellington, Salop (Samson).

#### PONIES.

Judges.—Mr. Bailey, Mr. Knight, and Colonel Maude.

Ponies not exceeding 13½ hands, in match pairs.—First prize of £15 to Mr. J. Allen Ransome, Ipswich (Sprite and Fairy); second of £10 to Mr. T. B. Ayshford, Waltham Green.

Ponies not exceeding 13½ hands, for saddle or harness.—First prize of £15 to Mr. B. Glynes, The Minorities (Polly); second of £10 to Mr. Harris Farquhar, Lowndes Square (Minnie Warren); third of £5 to Mr. J. Allen Ransome, Ipswich (Sprite); highly commended, Mr. H. Swaine, St. Albans (Jack); commended, Mr. Bamford, Cambridge (Weasel).

Ponies not exceeding 13 hands, for saddle or harness.—First prize of £15 to Mr. E. Talley, Birmingham (Billy); second of £10 to Mr. T. B. Myers, Porters, Hertis (Tom Thumb); third of £5 to Mr. J. C. Circuit, Rainham (Tommy).

EXTRA CLASS.—Prizes of £5 each to Mr. G. Bonner, Ruanon (stallion pony, Free Willie); Mr. E. Lumley, St. James's-street (stallion pony, Ruby); Mr. T. A. Jackson, Thornton House, Bradford (roadster stallion, Young Performer). Highly admired, but wrongly entered, Mr. T. Connolly, Castle-town, Celbridge (thoroughbred riding horse, Sanspareil); Mr. J. Manning, Arlington, Northampton (half-bred stallion, British Statesman).

VETERINARY ADVISER.—Professor Simonds.

**CATTLE POISONING BY RIFLE BULLETS.**—This subject has again been brought before the public by Mr. Cox, of Hendon, Middlesex. By this letter there appears to be no doubt whatever that cattle and sheep are deteriorated and destroyed by swallowing, among the grass they crop, the flattened bullets and splashings from the bullets fired at targets by the volunteers. It is therefore advisable that all targets placed in parks or fields where cattle and sheep graze, should be fenced round in such a manner that the stock could not reach the area within which the bullet splashings fall: "Sir,—The occupiers of land on which there is a rifle range should take precautions to prevent the access of cattle. Having given a range to the 12th Middlesex, I left the butts unenclosed. A few weeks since some of my sheep were observed first to become very thin, and then paralyzed. For a time there was no suspicion of the cause, but on cutting up one of them for the dogs, some lead fell from its stomach. On examination I found splashings of lead from the targets in every fold, and from this one sheep I thus extracted nearly half an ounce in weight of lead, many of the pieces being as large as a finger-nail. The same appearances were presented by others that died subsequently, and others are falling sick. As yet I have seen no apparent injury to the cows, which also fed in that field. It is a matter of serious moment, for the splashings from the target are found within a semi-circle of at least 100 yards, and this place should be enclosed to insure safety.—I am, &c.,—EDWARD W. COX, *Moad-Mount, Highwood, Hendon, Middlesex.*



## NORTHAMPTONSHIRE AGRICULTURAL SOCIETY.

## MEETING AT PETERBOROUGH.

The annual show of the Northamptonshire Agricultural Society was held at Peterborough, in conjunction with the agricultural society of that town, on Wednesday and Thursday, 5th and 6th of July. On our arrival in the town it was quite clear that the inhabitants were determined that no exertion should be wanting on their part to make the meeting of the two societies a success; for we found the town decorated with flags, triumphal arches, and so forth. A grand cricket-match, between the United Eleven of England and twenty-two of the Peterborough district, was to be played; a splendid flower-show was provided for those who prefer flowers to live-stock, and altogether a brilliant meeting was anticipated; but, alas! how soon are our brightest hopes overthrown, for the intense heat of Wednesday, which was almost too much for many of the animals unfortunately exposed to its influence, was followed by a perfect down-pour of rain, which, commencing at an early hour on the Thursday morning, continued, with only occasional intermission, all that day, thus seriously interfering with the pleasure of those who wished to examine the stock, as well as curtailing the show-yard receipts.

The show was held on the Borough Bury farm, in the occupation of Mr. Little, and a better site could not well be selected, being near the town, and from which a good view of the fine old cathedral could be obtained. About eleven acres were enclosed by boarding, and what should have been a protection from the weather was erected for the cattle, with some of the horses, and a good long shed for the rams was planned out, but not finished; so that these unfortunate animals, with some few exceptions were exposed to the heat of Wednesday and the deluge of Thursday. We believe the Committee of Management were very desirous that everything should be well done; but there are several little things that require amendment.

The judges were met at the Great Northern Hotel, at twelve o'clock on Wednesday, by Mr. Owen Wallis, as senior steward, and several of the committee, and, after partaking of luncheon, they proceeded to the showyard; and here appeared a regular piece of confusion—carpenters at work, roofing for sheds lying about, animals not all in their places, and stewards without definite instructions as to where they should be in attendance. At last, by the exertions of Mr. O. Wallis, the indefatigable Mr. Wetton, and Mr. Warwick, they proceeded to business. The judges of riding horses were accommodated with an ample ring in which to make their awards; but the cart-horse men were not so lucky, and were expected to judge the animals brought before them in a narrow alley, between two rows of stock. Of course they remonstrated, and finally refused to act unless more space was allotted to them. At last, by the courtesy of Mr. Warwick, who waited upon them, they commenced operations. We mention this in the hope that, in future, rings for judging all the horses and cattle may be provided, thus giving judges, as well as the animals upon which they adjudicate, fair play.

The show of shorthorn cattle was very good, and the first class remarkable for containing one of the best oxen that has been seen for many a day: if we could only alter the way in which he stands behind, we should consider Mr. Wood's beast as near perfection as possible. The second and third classes also contained some good

animals. Lord Spencer's "May Queen" is a superior cow; and it is to be regretted that she should have left the breeding herd at the early age of four years, or thereabouts. The grazing class of shorthorns was well filled; whilst the cross-breeds, Devons, and Welsh breeds were badly represented. The Hon. Colonel Pennant carried off the open prize of £20 with "Duke of Geneva" (19614); whilst Mr. Booth's "Prince Alfred," eleven years and a-half old, received a H. C., although we believe him to be quite useless for breeding purposes. "Baron Crossley," the first prize yearling at Newcastle last year, will be lucky if he ever obtains another. Mr. J. N. Beasley won the prize in class 12 with the American-bred bull "Second Duke of Airdrie," beating 11 others. Mr. Tisnian exhibited a yearling bull, "Fitz Paul," who won easily in a class of 11, and who, if he goes on well, will be sure to be again heard of. The cows were a good class of sixteen: Lady Pigot wins with the Towneley-bred "Perfume," as a three-year-old, and Mr. Booth with a two-year-old daughter of "Lord of the Valley," in a good class. Mr. Oliver has a first-rate yearling in "Campagna," who wins in a strong class of thirty. Lady Pigot's "Queen of Rosalie," the Ipswich yearling, is here the highly commended calf; Mr. Pawlett being declared the winner in a class of ten.

We had hoped for a great treat in looking over the riding and hunting horses in this good hunting county of Northampton, but must own that we were disappointed, some of the classes being indifferently filled, both as regards numbers and quality; not but that there were a few first-class animals, but on the whole the show of horses was not a satisfactory one. Lord Spencer's prize of £20 was taken by a very good mare and foal belonging to Mr. Bird, jun., the Hon. C. Fitzwilliam wins his own "Challenge Cup" with a smart rather slight mare and a nice foal at her foot, by Richmond. We preferred two or three of the others in the class in which Mr. Shaw wins £20 for the best five-year-old and upwards hunter, and think he was fortunate in selling his son of Cotherstone as he did; as Mr. Gale's black horse, or Mr. Whitehead's grey, would lose him in twenty minutes over the grass. The four-year-old bay of Mr. Earl is a very nice horse and worthy of his prize in spite of the temper he appears to inherit from his sire "Phlegon." Captain J. Booth wins the three-year-old prize with a very superior bay, a son of "Motley," and who promises to be as great a prize-taker as his "Beechwood," and is a better bred one, with plenty of power. There were fourteen in this class, and amongst them a smart cheat, by "Richmond;" but by no means were they a good lot. Mr. Lynes shows a brother and sister by the "Ugly Buck," as two-year-old and yearling, that are very good indeed, and will make first-raters if all's well. The hacknics and ponies were a motley group, but the prize pony a clipper. The twenty cart mares and foals were a sorry collection, and soon reduced by the judges for final examination to three, when two prove to be unsound, and there was considerable difficulty in finding a tolerably good-looking mare sound enough to receive the second prize. There was one good-looking two-year-old filly, but alas! she, too, was not approved by the veterinary inspector. The young geldings need no comment, at any rate in their praise; but the "Pair of cart horses" class comprised several

very fine animals; indeed, we have seldom seen four better geldings than were here shown. It has been said, perhaps with some truth, that the Suffolk horses are prone to have bad feet. We would for the future advise the breeders of other descriptions of cart-horses to look to the feet of their rough-legged favourite, as we are informed that *nearly all the mares shown at Peterborough had ossified cartilages.*

The shortness of feed must account for the small entries in many of the classes of sheep, and amongst which we did not notice anything requiring special mention, if we except the sheep shown by Mr. H. Aylmer, whose Brentwood and Norwich winner, in spite of the knocking about noticed last week, was selected as the winner amongst nineteen, whilst the Ipswich prize sheep did not even get commended. We ought not perhaps to omit to notice the Lincoln ram of Mr. Cullingwood, which struck us as being particularly good.

We would recommend the committee to classify their pigs in future, as on the present occasion "Berkshire," "small whites," and "Yorkshire large breed" all compete together, thus giving neither a fair chance. There was a small entry of pigs: Mr. Allender's Berkshire sows were good, and Mr. W. G. Phillips showed a clever pen of five breeding pigs, of one litter, of the small white breed.

There were 17 entries of butter to compete for six prizes, to gain a share of which there appeared to be a great anxiety displayed by the respective competitors.

Fortunately, the rain abated in the course of the afternoon, and a mixed company of ladies and gentlemen nearly filled the large tent in which dinner had been set for between 400 and 500; Lord Lynden presided, supported by the Lord Bishop of Peterborough, and the would-be Members for the county of Northampton and the City of Peterborough. There were some good-natured and amusing speeches made by these gentlemen, an excellent dinner was done ample justice to, and a very pleasant afternoon spent.

There was a goodly assortment of the best implements of the day exhibited by Messrs. Amies, Barford, and Co., Vergette, and others.

## PRIZE LIST.

### BEAST.

The best Shorthorned ox, exceeding three years old, without restrictions as to feed, first prize of £15 to R. Wood, Clapton, Thrapston; second of £7 10s., to W. H. Baker, Cottesmore, Oakham.

Shorthorned steer, not exceeding three years old, £10 to the Marquis of Exeter, Burghley House, Stamford; and £5 to W. H. Baker, Cottesmore.

Or steer of any breed or age (Shorthorned excepted), £10 to J. Manning, Orlingbury.

Cow of any breed or age, £10 to Earl Spencer; and £5 to John Lynn, Church Farm, Stroxtan.

Heifer of any breed, not exceeding four years old, £10 to P. and R. Phipps, Collingtree Grange and Northampton; and £5 to Mark Sharnham, Wellingborough.

Pair of Shorthorned oxen or steers, £10 to Rowland Wood, Clapton, Thrapston.

Pair of Hereford or Shropshire oxen or steers, £10 to Wm. Adcock, Farndish.

Pair of Devon oxen or steers, £10 to Sir Charles Isham, Bart., Lampart.

Pair of cross-bred oxen or steers, £10 to Saml. Wallis, Barton Seagrave.

Pair of Welsh oxen or steers, £10 to Owen Wallis, Overstone Grange.

Bull of any age, £20 to Colonel the Hon. E. G. D. Pennant, Penrhyn Castle, Bangor.

Bull above two years old, £15 to Jos. Noble, Beasley, Chapel Brampton; and £5 to the Marquis of Exeter.

Bull under two years of age, £15 to W. Siaman, Buckworth Lodge, Kimbolton; and £5 to A. J. Roberts, Lillingstone Dayrell, Bucks.

Cow of any breed, £10 to J. Lynn, Stroxtan; and £5 to Earl Spencer, Althorp Park.

Heifer of any breed, £10 to Lady E. Pigot, of Branches Park, Newmarket; and £5 to Wm. Slesman.

Heifer of any breed, above two and under three years old, £10 to T. C. Booth, Warlaby, Northallerton; and £5 to John Lynn, Stroxtan.

Heifer of any breed, above one and under two years old, £7 to R. E. Oliver, Sholebrook Lodge; and £3 to Lady E. Pigot, Branches Park, Newmarket.

Heifer calf of any breed, under twelve months old, £5 to T. E. Pawlett, Beeston, Sandy, Beds.

Shorthorn steer, under two years of age, £5 to James Howe, Broughton, Hunts.

Shorthorn heifer, above one and under two years old, £20 to R. E. Oliver, Towcester.

### HORSES.

Stallion for agricultural purposes, £10 to John Manning, Orlingbury; and £5 to J. Blad, Hanslope.

Thoroughbred stallion, calculated to improve and perpetuate the breed of sound and stout horses, £20 to John Manning, Orlingbury.

Mare and foal for hunting purposes, £20 to J. Bird, jun., Norman Cross, Hunts.

Mare suitable for hunting purposes, a challenge cup to the Hon. C. W. Fitzwilliam, Alwalton, Peterborough.

Mare or gelding, five years old and upwards, £20 to Wm. Shaw, Far Cotton.

Mare or gelding, above four and under five years old, £20 to T. Earl, Morbourn, Yaxley.

Colt or filly, above three and under four years old, £10 to John B. Booth, Killierby Hall, Ousterick.

Colt or filly, above two and under three years old, £10 to G. B. Lynes, Preston Deanery.

Colt or filly, above one and under two years old, £10 to Sir Charles Isham, Bart., Lampart Hall.

Hackney mare or gelding, £10 to Lady Dorothy Fitzwilliam, Harrowden House.

Pony not exceeding 13½ hands high, £5 to W. H. Baker, Cottesmore.

Cart mare with foal at foot, £10 to Geo. Maxwell, Walton; and £5 to Robert Lee Bradshaw, jun., the Bookery, Tinwell, Stamford.

Cart gelding, above two and under three years old, £7 to George Fullard, Thorney; and £3 to Hy. Burgess, Middleton.

Cart filly, above two and under three years old, £7 to Jas. Speechley, Yaxley; and £3 to Thos. Farnell, Thorney.

Yearling cart gelding, £5 to R. B. Warwick, Stanground; and £3 to Henry Cooke, Crowland.

Yearling colt filly, £5 to H. Burgess, Middleton; and £3 to R. Wood, Clapton.

Two cart horses, £7 to J. Bird, Norman Cross; and £3 to Samuel Marriot, of Fletton.

### SHEEP.

(Open to all England.)—Best pen of 20 long-woolled ewes that have suckled lambs to the 1st of June, 1885, £10 to John Shaw, Hunbury Hill, Northampton.

Best pen of 5 long-woolled ewes, &c., £5 to John Beasley, Overstone; and £2 10s. to Saville Middleton, Water Newton.

Best pen of 5 long-woolled theaves, £5 to Clarke Hales, Manor House, Basingbourne; and £2 10s., to the Marquis of Exeter.

Best pen of 10 Lincoln long-woolled theaves, £5 to John Edwards, Buckworth; and £2 10s. to John Whitehead Moore, Eye.

Best pen of 5 cross-bred ewes, £5 to John K. Shrimpton, Eastington Farm, Thame; and £2 10s. to Geo. M. Dunn, Great Billing.

Best pen of 5 cross-bred theaves, £5 to Frank Battcock, Hemmingford; and £2 10s. to ditto.

Best pen of 3 cross-bred shearhogs, £5 to Frank Battcock; and £2 10s. to Saville Middleton.

Best pen of 3 long-woolled shearhogs, £5 to Saville Middleton; and £2 10s. to the Marquis of Exeter.

Best shearing Leicester tup, £10 to Arthur Dabbs, Seckington.

Best shearing Lincoln tup, £10 to Thomas B. Marshall, Branton.

Best shearing Gloucester tup, £10 to Mr. John Gillett, Oaklands.

Best Lincoln long-woolled two-shear tup, £10 to Wm. Collingwood, Ermine House, Fulbeck.

Best long-woolled tup of any breed, £10 to Hugh Ayhuer, West Dereham Abbey, Norfolk.

Best 5 long-woolled wether lambs, £3 to John Whitehead Moore; and £1 10s. to Saville Middleton.

Best 5 long-woolled ewe lambs, £3 to Clarke Hales; and £1 10s. to Saville Middleton.

Best 5 short-woolled or half-bred wether lambs, £3 to Frank Battcock; and £1 10s. to ditto.

Best 5 short-woolled or half-bred ewe lambs, £3 and £1 10s. to F. Battcock.

### PIGS.

Best boar of any breed, first prize of £5 to Edward Fullard, Abbey Farm, Crowland; second of £3 to James Turner, Haddon Grange, Peterborough.

Breeding or suckling sow of any breed, £5 and £3 to G. M. Allender, Lee Grange, Winalow, Bucks.

Three fat pigs of one litter, £5 to the Ladies Wentworth Fitzwilliam, Harrowden House.

Five breeding pigs of one litter, £5 to W. G. Phillips, Northampton.

#### IMPLEMENTS.

For the best collection of the most improved agricultural

implements, £10 to Amies, Barford, and Co., of Peterborough; and £5 to G. Vergette, of Peterborough.

Narrow-wheel waggon, £5 to Ball and Son, Rothwell.

Narrow-wheel cart, £3 to Hayes and Son, Stamford.

Broad-wheel cart, £3 to ditto.

Light one-horse vehicle, on two wheels, £5 to Thomas Brainsby, Peterborough.

Pony carriage, on four wheels, £5 to J. Wilson, Gold-street, Northampton.

### THE ROYAL AGRICULTURAL SOCIETY OF IRELAND.

The monthly meeting of the council of the society was held on Thursday, July 5, at 12, Upper Sackville-street, Lord James Butler in the chair.

#### LABOURERS' COTTAGES.

A communication was received from Capt. Pack Beresford, M.P., in reference to the challenge cup for labourers' cottages, from which we take the following extract:—

"In returning the Leinster Challenge Cup, I should be glad to be allowed to submit to the council of the Royal Agricultural Society the propriety of altering the rules for future competition. As these rules at present stand, no landed proprietor of ordinary means can hope to hold the cup for more than one year, as it is obviously impossible to continue to build the special number of cottages year after year. To secure the improvement of agricultural labourers' cottages all interested in the prosperity of Ireland so much desire, I would suggest that the person to whom the cup had been awarded should not be required to resign it, unless the judges reported that the competitor in the ensuing year had built either on a larger scale in proportion to the extent of his property, or on an improved plan. I think a rule of this description would tend much to enhance the value of the award of the challenge cup, and at the same time stimulate proprietors of landed estates to build year by year cottages affording increased accommodation to the labourers."

**MAJOR BORROWES:** If he wanted to retain the cup he might have divided the number of cottages he built, and spread them over a number of years, and thus have secured the cup.

**MR. WADE:** The cup was given by his Grace the Duke of Leinster, and the terms upon which it is to be won could not be altered without his sanction. It is a regular Irish battle, to be fought in perpetuity.

**CHAIRMAN:** It was given by the Duke as a perpetual challenge cup to the person who shall have built in 1863-64 the greatest number of the most approved labourers' cottages which shall have been declared entitled to the provincial gold medal.

**MR. FOWLER:** I remember quite well that his Grace made a speech at the time, in which he stated that it was to be perpetual.

**CHAIRMAN:** The secretary had better communicate those conditions to Captain Beresford, which we have no power to alter.

**Sir ROBERT PAUL:** If we were getting up a new cup we might take the subject to which he refers into our consideration.

Captain THORNHILL was requested to call the attention of Captain Beresford to the conditions imposed by the donor before it became the property of a competitor.

#### THE SLIGO SHOW.

Captain THORNHILL stated that at the last meeting of the council Mr. Reynell claimed a prize for a heifer which he exhibited at Sligo, when it was decided that he should not get it, as the animal had not calved in the specified time. Mr. Fetherstone was now—as he was then—of opinion that there was no rule requiring that he should declare that the cow was in calf at all.

**MR. RIAL:** What is the prize for?

**MR. WADE:** The prize is for the best heifer calved in 1863-4. Believing the council were in error he would give

notice that on the next day of meeting he would move that the resolution of the council of the 25th May, relative to the case of Mr. Reynell's Hereford heifer, entered in Class B, sec. 4, be rescinded, it not being necessary that a heifer in that section should be in calf, and that the council do direct the prize be paid to Mr. Reynell, as awarded by the judges.

#### THE EPIDEMIC AMONGST SWINE, AND THE EFFECTS OF THE REMOVAL OF HORNS FROM CATTLE.

Professor FERGUSON said: According to your instructions, received through the medium of your secretary, I have made extensive investigations relative to the present epizootic among the pigs of this country, by observing several cases in the different stages of the disease, and making numerous *post mortem* examinations of those that terminated fatally. I also had pigs killed in the different stages of the malady for the purpose of examining their organs and tissues—by no means an easy task for, as a general rule, though occasional exceptional cases present themselves, the disease, in well marked cases, is so rapid in its course, from the appearance of its first recognisable symptoms to its fatal termination, that it is difficult to secure upon any particular and required stage, and, too often, even to recognise it. The disease is by no means a new one, nor a novel visitor to Ireland. A quarter of a century ago it reigned as an epidemic in the south of Ireland; it had previously been most destructive in the south of France. For the last three years it has been very prevalent in the county of Dublin. It is now raging with unprecedented violence in the southern, at least half of the inland. One of its characteristics is the suddenness of its attack, and the extraordinary rapidity with which it runs on to a fatal termination; in many instances death taking place in less than a couple of hours, although the animals up to the moment of the attack seemed in perfect health, lively, and feeding well. I was last year consulted relative to two cases subsequently to their death, their owner feeling confident that they had been poisoned. They, with some others, were left at their troughs feeding voraciously, and seemingly in the best of health. In about an hour and a-half one of them was found stretched dead in the sty. In three-quarters of an hour more the other shared his fate. On seeing their carcasses the cause of death was evident at the first glance. The skin was very red, particularly about the head, inside the legs, and on the abdomen. In these places the colour was like that presented on the surface of the human body in a case of scarletina, with the eruption at the zenith of its development. On dissecting these pigs, the lungs, heart, stomach, intestines, liver, spleen, kidneys, and all other organs contained in the chest and abdomen were found quite unaltered from their natural appearance in a thoroughly healthy animal; but on examining the brains, they and their membranes or coverings were found greatly congested, and to contain well marked serous and other effusions, evidently of recent and sudden occurrence. Their blood vessels were greatly distended, and in each case had in one place given way, and caused apoplectic effusion—the immediate cause of the sudden death. Before

the termination of the week seven more pigs died in the same place, but not so suddenly, some lingering on for three days. The skin of all the fatal cases was of the red colour already described; there was well marked effusion on and in the brains of all of them. In the majority of instances in which the disease causes death the fatal termination is caused by the effect of the malady on the brain and nervous centres. The interior of the throat is generally inflamed, sometimes a little ulcerated, and occasionally much swelled, terminating in gangrene. The affection, like scarletina in the human subject, is evidently a blood disease. The system is affected by the poison before the animals show any symptom of indisposition. In fact, it generally happens that their doom is irrevocably sealed before they evince any indisposition. In some parts of the country pigs affected with this disease are called "soldiers," from the redness of their skin bearing a resemblance in colour to the "red coat" of the British army. The disease is decidedly both infectious and contagious; yet when it is epidemical, or even endemical, it frequently attacks and kills individual pigs that are so isolated as not for many months to have come in contact with any other animal, nor with any person or thing that had been near any sources of contagion or infection, other than the surrounding atmosphere. Like most specific animal poisons, it sometimes affects different organs of the body. It is decidedly typhoid in its tendency, notwithstanding the beneficial effects often caused by bleeding, which, however, are explicable by the relief thus afforded to the congested vessels of the brain. Treatment is most unpromising. In the great majority of instances the malady sets medical aid at defiance, and rapidly runs its course to a fatal termination. When the animal is first observed to be ill, he should be separated from the rest and put into a moderately cool, well-ventilated place, and, according to his size and age, get from five to twenty grains of calomel and from two to six ounces of glauber salts, repeating the dose every four hours till purgation shall have been produced. Purgation is the grand sheet anchor of successful treatment. Once the bowels have well acted, one scruple of chlorate of potash should be given in solution every six hours. The skin of the animal should be well washed with soap and water from all impurities; but as soon as possible before washing blood should be taken from the palate of the mouth and ears. The animal should not be forced to take food; the lighter the diet the better. Even if the pig is disposed to eat, food should be kept from it for the first fifteen or twenty hours, and then but given sparingly. The higher the condition of the pig the more likely for the disease not alone to affect him, but to terminate fatally. While the malady is prevalent, stores should be kept low, and if possible turned out into a large enclosure; also well purged. A convenient purge for a pig, as it can be given mixed in the food, is powdered castor oil seeds from two to four drachms, with rye flour, eight or nine ounces, well mixed together, and given in the food. A little chlorate of potash, about five grains for each pig, given daily for a week or ten days, is an excellent blood purifier. The practice of mixing flowers of sulphur in the food for pigs is a most excellent one; its effects on the animals are laxative. During the present epidemic, pigs should have a little sulphur daily. If so treated, not crowded nor over fed, allowed sufficient exercise, and when put up, kept in properly ventilated places, they will seldom become affected with the present epizootic. Cleanliness should be strictly enjoined.

Mr. RIALI: I read some time ago, in an article in the *Farmers' Gazette*, speaking of this disease in pigs, that if you gave them once a month a dose of garlic in their food, it would be a preventive to sickness.

Professor FERGUSON: It may assist. There is no doubt that garlic is a very potent medicine. The fact that garlic being placed between the skin and flesh of young stock has the effect in nineteen cases out of twenty of preventing blackleg shows how powerful it is.

Mr. RIALI: Will it prevent distemper from spreading amongst pigs?

Professor FERGUSON: It will not. Within the last fortnight I was called on to see some pigs belonging to a farmer who gave them garlic in their food every day, notwithstanding

which it did not prevent them being diseased. But as a sanitary agent garlic is very good. Conceiving that every question appertaining to any matter connected with live stock is legitimately within the province of your society's consideration, I venture to bring under your notice one which, although doubtless novel to the major part of the agricultural and general community, is at present occupying considerable attention, not alone in the cattle trade, but also with the public in general—I allude to the practice of removing the horns from young stock, with the view of rendering them more profitable to the grazier. I respectfully take the liberty of suggesting that it is a matter, the merits and demerits of which are worthy of being fairly and impartially investigated under the sanction of your society. Should you consider it so, I shall feel pleasure in collecting and laying before you such evidence and information as I may succeed in obtaining.

CHAIRMAN: The subject is a most legitimate one to bring before the council, and the suggestion such as should meet with consideration. I cannot conceive any benefit arising from the practice.

Mr. WADE observed that in England and Scotland polled cattle brought £1 a head more than others.

Professor FERGUSON said that until the matter was brought under his notice by the Society for the Prevention of Cruelty to Animals he had never seen a case of the kind. He had not the slightest doubt on his mind but that the market price of the animal was decidedly increased in value, and not from any imposition, as far as appearance was concerned. He granted that the animals did not increase to greater extent in gross weight, but the neck became less developed when the horns were taken off. In proof of this statement he need only refer to the Spanish oxen they saw going through the streets. If they pinioned a fowl they would find that the large pectoral muscle became less developed; and if they kept the wing of a fowl cut close they would perceive that very shortly that muscle ceased to be developed like its fellow on the other side.

Mr. RIALI remarked, that if they took a calf and castrated him, they would find him having larger horns than one who had not undergone a similar operation.

Professor FERGUSON replied that the increase of horns in the bullock was a result of the balance in the distribution of the system being lost. He was anxious to have the matter fully and impartially investigated.

Sir ROBERT PAUL said, if the animal could in any way be improved by the operation, like castration, he did not see why it should not be done, provided it was done properly.

Professor FERGUSON observed that the operation was by no means so painful as ringing a pig, or castration. If they took a bullock by the nose one man could hold him by the hand; but after the operation in question was performed, they might stick, as he saw done, an iron into that part of his skull, and he would pull five or six men away.

Mr. FOWLER understood that in the country they not unfrequently saw the horns off.

Professor FERGUSON said they did. He saw a man some days previously taking off the horns in a very peculiar way. In the first place he struck one horn a slight blow on the side of its tip, and then he turned the other side and did the same, and he only hit it two blows. He did the same to the other horn, after which he inserted a knife round the base of the horns, and away they came with but little force. The manner in which the operation was effected in the county of Dublin was most barbarous. It was not only the horns that were removed, but also a portion of the skull.

Mr. FOWLER expressed the gratification he felt at hearing the able statement of Professor Ferguson, and concluded by moving a vote of thanks to that gentleman for his lucid report, and for the able manner in which he had brought the subject under the notice of the council.

Lieutenant-General HALL felt much pleasure in seconding the resolution, which was unanimously adopted.

#### THE CLONMEL SHOW.

A letter was received from the private secretary of the Lord Lieutenant, intimating that it would afford his Excellency much pleasure to accede to the invitation of the society to be present at the annual show in Clonmel, if the forthcoming elections did not interfere with such an arrangement.

## PUBLIC HIGHWAYS.

BY A PRACTICAL FARMER.

We are under a somewhat stringent order of things relative to our public highways. In almost every country parish there are many roads of considerable length and breadth yielding a large amount of good herbage, but of which no animal, belonging either to a parishioner on an "outennar," is legally permitted to crop a mouthful. The owner of any animal travelling along a public highway at a less rate of speed than one mile per hour is indictable for suffering his stock to be depasturing on "the highway." The animal therefore must crop blade by blade as he walks along, or go without. Neither must his owner cut him a mouthful of any of this full-grown and tempting grass. It is the property of "the parish," or rather the public, and trespassers in this way are liable to prosecution. Moreover, "the parish" has not legally the power to let or sell this said herbage, however high, thick, and injuriously it may grow. The parochial officer may, or rather he must cut it down to keep his roads dry and in good condition and repair; but he has no power to dispose of any portion of it profitably. It is said "the frontage proprietors" have a right to all herbage growing on the roads opposite their fields or frontage. This, we believe, is a mistake. The public road belongs to the public, and no one has a legal right to interfere with it. It is true that the parishioners of any parish may meet in vestry, and by a unanimous vote they may agree to let or sell the herbage growing so superfluously upon their parochial roads, and may do so, provided the proceeds are duly paid to the account of the surveyor of highways on behalf of such parish; but any parishioner may object to this course, and probably frustrate it. I live in a parish containing very many miles of wide grassy roads, and growing so high as to be really detrimental to the well-being of these roads. They would let to realize some £20 to £30 per annum, and save the cost of keeping down by the surveyor; but having no power, the herbage is becoming a real nuisance. Would it not be advantageous to vest a power in the parish officer's hands to deal with them and the herbage as his discretion and judgment dictated? It certainly is not right to waste it, or trample it down, so as to be of no value; and where can be the hurt of letting it, under proper restrictions?

Another somewhat harsh, and often proving a hard order of things, is the law of impounding from public roads. The clause in the Highway Act, permitting the depasturing of roads, under the care of a keeper or tender, is repealed; therefore no stock is allowed to be on the road, except as drift stock, under the care of a drover; no, not even in going from pasture to pasture, if the owner is known to drive them thus for the stealthy purpose of feeding off the road pasturage. They must be driven fairly from field to field, or the like, and not in a roundabout way, with the intention of evading the law: in this way they are trespassers, and punishable accordingly. It has become customary for parochial officers to obtain summonses for any parties suffering their stock to be depastured on the public roads, in order that every case may be brought fairly under magisterial jurisdiction, and thus have everything fair and above board; but it is by no means requisite. Any person can impound stock found on "the highway." It is customary to appoint an impounder for each parish. It takes off a little of the odium and unpleasantness which would arise continually by one

neighbour taking charge of another neighbour's stock; but this is quite unnecessary. It is as I have said—that any person is at full liberty to take charge of any stock he may find straying on a public highway; and it is at the option of the party having the charge of the stock so found straying, either to take them to some safe place of custody, but not necessarily to a public pound, although for general convenience that would appear to be the proper place—but he can take them, as I say, to some safe place of custody, and charge to the amount of 5s. per head for his trouble, but not more; or he can if he so pleases, and knows to whom the stock belongs, take them to the proprietor's premises, and charge him the same amount; or he can, if it should still better please him, summon the owner before the magisterial bench, and get him fined for the trespass or the depasturing; and I believe the law regarding this trespassing is so stringent, that magistrates have no power to alter the charge upon appeal. Of this however I am not quite assured; but be that as it may, it is no enviable position for the stock-owner to be in. Any litigious neighbour or disappointed labourer may be continually on the watch to catch any stray cattle or sheep over the ditch; or, if poor piggy (mischievous rogue as he is!) should break his sty, off he goes; and if met on the highway in such custody, the owner has no legal power to claim him and take him away; but should he persist and forcibly do so, he is punishable by magisterial authority for the rescue. Now, I think this is decidedly wrong. The public roads for the time being should be under the control of the public officer, and let him be the party to prevent any inroads or wrong being done; but surely it cannot be right to lie under the caprice or malicious illnature of any evil-disposed person to do you an injury.

I fully approve of the laudable endeavour to prevent road-stocking; no one knows the many petty annoyances it subjects occupiers to, but those who experience it. And it is frequently very costly. I have several times had a portion of my flock greatly injured by coming into contact with road-stock having that provokingly contagious disease the "scab," and the foot-and-mouth disease too has been thus brought to my fields, to say nothing of broken gates, fences, &c. &c. It is perfectly right to prevent this, but what I strongly complain of is the manner of doing it. I should not object to the rural police giving information of such trespassing. They are not overburdened with duties in my district, and they possibly might find time to take stock into safe custody. We certainly pay dearly for the little protection we get; why not let them aid in preventing these public annoyances? It cannot well be in a worse or more unsatisfactory state than it now is. I trust another Parliament will take it up. There is one retrieving point in this custody. The owner may demand that his stock shall be well taken care of—not as is often the case, to be kept in a public pound without food or drink—and failing this his remedy is to sue for any damage or loss of condition they may sustain while in such custody. Nor do I think the impounder can charge for keeping beyond an average sum per head according to the price paid in the district. When stock is in such custody the sum charged must be paid before they are released, or the keeper of the pound or place of custody becomes liable to the impounder if he gives them up. If

stock is improperly impounded, the best remedy against the impounder is an action for damages in the County Court. It appears to me that these regulations with respect to highways were framed without any regard to the rural police force at all. They can look after poachers, and they often get our poor tired servants fined for riding in their waggons. They look after very many trifling

matters of illegal character. Now, if it is unlawful for stock to stray or be depastured on a public highway, who so proper to look after them or take charge of them as a paid officer of the public? I think it ought to be a part of the duties of the rural police to protect occupiers against injustice, as well as to prevent illegal trespassing.

## THE SUMMER HOUSE-FEEDING OF DAIRY STOCK.

There is no domestic animal that will give a more grateful or overflowing return for good keep than the cow, and no branch of husbandry that will pay better for good management than the dairy. The produce of the cow being such an important article of food, there is a constant and ever-increasing demand for it, whether in its natural state as milk, or when manufactured into butter and cheese. The high price obtained for these articles renders it well worth the exercise of a little judgment and forethought on the part of the farmer in providing such variety of food for his cattle as will enable them not only to give an increased amount of produce, but continue it for the greater part of the year. Almost every arable farmer has the means within his reach, and the power if he chooses to exercise it, of growing such crops as will enable him to partially feed inside, increase his number of stock, and greatly enrich his land.

The importance of having a supply of food other than the grass during the summer months can scarcely be over-estimated. The animals are not only kept in excellent condition by having a feed before them when they come in to be milked morning and evening, but the milk is increased and enriched, and the return in hard cash for the season nearly doubled. The manure heap is increased to an enormous extent, and thereby augmented fertility being carried to the fields, becomes a never-failing source of wealth to the farmer.

No occupier of land or owner of stock, who has once tried the full-feeding system, and compared it with the ordinary one of trusting wholly, or almost so, to what the animals themselves can gather from the fields, will willingly give it up.

A newly-calved cow will, during the month of May, and possibly, if the season is moist, for a portion of June, give a large flow of milk on nothing but grass. By the middle of June, when the sun has been for some time powerful, the grass loses its succulence, becoming brown and hard, and she then falls rapidly off. The cow that, from the period of her calving, has been fed inside as well as out, will, on the contrary, be scarcely affected by the altered condition of the pastures, and will keep up her flow of milk in almost undiminished quantity. Not only will she do so during the summer months, but will run on, with the aid of the aftermath, far into autumn before her produce in money value is very perceptibly lower. And here let it be noticed that the produce of a well-fed cow is not to be estimated merely by the quantity of milk she gives; as late in autumn, when the milk by measure is not more than half what it was three months previous, the butter product will be comparatively little decreased. The quality also, on account of the maturity of the food, the coolness of the weather, and consequent firmness and richness imparted to the butter, is very much improved. The approach of winter finds the house-fed cow fat; or if not quite so, at least in such excellent condition that a very moderate supply of food will carry her on until she again calves. There is no more beautiful sight to be seen on a farm than a herd of well-selected and well-fed dairy cows. The high feeding clears the skin, and brings out the colours bright and pure, showing off their sleek sides to the best advantage. Such animals spend most of their time in a recumbent posture ruminating, feeding mostly during early morning, and in the cool of the evening.

Unless under very favourable circumstances, the produce of a dairy stock depending entirely on the pastures will seldom exceed £10 per cow, sinking in unfavourable seasons to even considerably less. On the other hand, when the stock receive food in-doors in addition to what they themselves collect, the receipts will rise easily to £14, and in particularly favourable

seasons to £16 and even £18. This refers only to cattle fed with food grown on the farm, with the exception of a few lbs. of crushed oats daily for a few weeks after calving, when that happens to take place early in the season, no concentrated food being given. Where brewers' grains are used, in conjunction with home-grown food, if only to the extent of from £2 to £3 in the year for each beast, and where there is a first-class market for dairy produce, it is no unusual thing to make £25 per cow during the season.

A most important feature in having a plentiful supply of home food provided for dairy stock is the facility thereby given for keeping them inside during the warm days of mid-summer. At this period of the year, when the tormenting gad-flies are numerous, the poor animals, if out, instead of quietly feeding, are galloping from field to field, vainly trying to escape from their small but cruel and pertinacious enemy. To such a scene as this—and who has not seen it and pitied them?—a herd of cattle lying in their stalls quietly and contentedly ruminating, while protected from the burning glare of the sun, affords a pleasing contrast. Humanity, in this instance, brings its own reward, and that speedily, as the house-fed cow will, in the evening, when the dairymaid makes her call, fill the pail, while the other that has been wearied out by running, will, to the infinite chagrin and disappointment of the milker, scarcely give half.

Another very important, though at first sight apparently trivial advantage, is gained by having the cows convenient during the flush of the season; and that is, they may be milked three times a day with comparative ease. This of course entails a little extra trouble, but that it will repay the trouble, and that amply, a few weeks' trial will abundantly testify. Where this system is understood and acted upon, the cows are often driven a considerable distance for the purpose of being milked during the middle of the day, and so convinced of its profitability are those who follow the practice, that they continue it far into the season, and long after the cow has begun to decrease in her produce.

The experience of a lady, the owner of about 50 dairy cows, and who pays the most rigid attention to obtaining the largest possible return from them, is on this subject as follows:—"That in autumn, when shortening days and diminished produce compel her to stop the mid-day milking, the money receipts from her dairy fall off, in little more than a week, fully one-third." The pastures on which this herd feed are mostly bare, never in the best of seasons affording a full bite, the situation being high, the soil thin and strong, and consequently easily affected by the sun. With all these drawbacks—and very discouraging ones they are, as all know who have much to do with this branch of farming—the dairy above alluded to is made to pay well, the receipts from each cow averaging about 14 guineas for the season. On light land such a return is a very large one, nothing having to be deducted for purchased food, and never could be attained but for the partial house-feeding system being constantly adhered to, and cleanliness and economy in all the details of the dairy, being the continual study of the parties connected with its management. If in this case the cows get nothing but what they gathered in the fields, not only would fewer animals be supported, but the yearly average would sink to about £8 per cow.

It is popularly supposed that dairy stock impoverish the land they feed on; the reason assigned being that they carry away the phosphates without making an adequate return. The soil thus robbed of its most valuable constituents, and its perma-

nent resources trespassed upon, yearly becomes poorer, and less able to support the stock; their produce in milk, butter, or cheese decreasing in a corresponding ratio. Agricultural chemists invariably support this theory, instancing the deterioration of the Cheshire dairy pastures as a standing practical illustration of its truth.

That practice and theory agree in this case, no one who has read Caird's "English Agriculture," can for a moment doubt. He there shows that under the very best management 3 acres were required to support one cow; next  $3\frac{1}{2}$  acres; lastly, and by far the greater proportion, 4 acres were required for the keep of one cow. Under such a system as this, nearly half the farm required to be meadowed each season to provide winter food for the cattle. The pastures were thus grazed and mown alternately, a mode of farming the most exhaustive that could well be conceived.

By liberal feeding indoors as well as out, a cow may be easily kept on two statute acres, and the utmost profit extracted from her that she is capable of giving; at the same time, instead of deteriorating, the land becoming very much enriched.

Under the old system, the cows must be so managed as that they will calve not sooner than there will be a full bite of grass ready for them, otherwise they will dry up and milk but indifferently even when they get the grass. Quite the contrary is the case when an abundant supply of food has been provided, the very depth of winter being then the most profitable period at which they can be had to drop their calves. At that season, often a half, always a third more money is got for dairy produce, the extra price making in the course of three months a most important item in the season's receipts. The early-calved and well-fed cow will, during the summer, give nearly as much milk as the late-calver that gets nothing but grass, and has to roam over a large extent of ground to pick up a subsistence. Another consideration, and one not at all to be overlooked, is the profit derived from the calves when dropped early. A calf born—say in January, is finished with

milk and ready for the grass by the 1st of May. Before the approach of winter it has gathered strength, and can accommodate itself at once to the change of food without loss of condition; and if well wintered, will, in the ensuing spring, have more the appearance and be nearer the value of a two-year-old than a yearling.

The full-feeding system is better understood now, and much more generally acted upon than it was formerly; and, encouraged by the high prices obtained for its produce, dairy husbandry is extending itself, and penetrating into the most remote districts of the kingdom. Even in the Highlands of Scotland, where sheep and black cattle were until lately the only stock considered suitable, the Ayrshire cow is fast displacing them, so much so indeed that a very serious diminution in the numbers of young black cattle at the Lowland fairs is beginning to be observable. At late fairs dealers have experienced the greatest difficulty in making up their lots to take south, and have had to give such prices as would scarcely have been dreamed of a few years ago. This is partly due to the extension of sheep walks and deer forests, but also in a great measure undoubtedly to the introduction of dairy stock, and consequent displacement of the native breeds.

The Scotch carry out the full-feeding system probably to a greater extent than is done in either England or Ireland. Their favourite breed for purely dairy purposes is the Ayrshire, and it is astonishing how by constant care and attention the milking qualities of this breed have been developed. A small cow, scarcely larger than a Shorthorn yearling, and costing from £10 to £12, will, by the excellent system of feeding carried out, yield produce in one season to the extent of twice her own value. Such a return is surely ample encouragement to all who are favourably situated for so doing, to carry out the full-feeding system; as, being the owner of a herd of well-fed cows, a man has not only, as the natural and unfailing results, rich land, an easy and contented mind, but a comfortable and ever-increasing balance at his bankers'.

J. S.

## THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

### TYPHUS IN PIGS.

At the weekly meeting of the Royal Agricultural Society, held on Wednesday, June 21st, in Hanover-square, Mr. Raymond Barker in the Chair, a lecture was delivered by Dr. Budd, of Clifton, "On a Disease in Pigs lately prevalent in the Western Counties."

Dr. BUDD said: I feel that, as a medical man chiefly concerned with diseases in the human subject, I lay myself open to the charge of presumption in attempting to speak of diseases in animals before an agricultural audience, and especially in the presence of so distinguished a veterinarian as my friend Professor Simonds. I must rely for my vindication on the following facts: That the particular disease, of which I am about to show some results, is one of the greatest scientific importance; that, although it has been incidentally noticed in veterinary and scientific journals, it has never, so far as I am aware, been scientifically and systematically described; and that within the last few years it has been the cause of enormous mortality among pigs in various parts of the kingdom—a mortality which is still proceeding, and which, if I may depend upon the statements of persons connected with the pig-trade, is likely to affect materially the price of pork; and I need scarcely observe that in these days of dear meat anything which has such an effect upon an article that enters so largely into the food of the working-classes, is matter of national concern. Another motive for my bringing this under your notice is, that the opportunities for prosecuting the inquiry further have passed out of my hands. The disorder, which was apparently very rife in my neighbourhood at one time, has now died out, and I am extremely anxious that the few rudiments which I have brought together should not be allowed to perish, but be placed in the hands of more competent persons than myself, and persons having a larger field for investigations of this kind. It may simplify what I

have to say, if I at once state that the conception I have formed of this particular disorder is that it is of a typhoid character. Most of you are no doubt sufficiently familiar with the disease called "typhoid fever" and sometimes "gastric fever" in man. That disease is attended and characterised by a peculiar ulceration of the intestinal follicles. So with the disease in the pig: it too is a typhoid fever, characterised and attended by a peculiar series of ulcerations of the intestines, which are in some respects the very counterpart of the ulcerations found in the human intestines. But my idea is that the two diseases are not identical, or are not interchangeable—that is, are not communicable from the man to the pig, or from the pig to the man, though they bear an exact resemblance to each other. The pig fever stands towards the typhoid fever in man in just the same sort of relation that smallpox in sheep stands to human smallpox. My first acquaintance with the disorder I owe to Professor John Gamgee, of the Veterinary College, Edinburgh. In August last he wrote me a short note, which stated that a very remarkable and fatal outbreak of true typhoid fever had occurred among the pigs in that neighbourhood; that the disease had been attended by ulcerations of the intestinal canal, the precise counterpart of those attendant on fever in man; that it had been imported into Edinburgh among stock brought from Wolverhampton, but had been extinguished by the measures which had been directed against contagion. He closed his note by offering to send me specimens, or a whole pig if I desired it. Feeling that it was a case in which, if in any way, it was desirable to "go the whole hog," I telegraphed to him to send me a pig, and accordingly he sent me one that had been dead thirty-six hours. The weather was very hot at the time, so that when the pig reached me it was in an advanced stage of decomposition. That, however, did not prevent me from examining it, and the result was that I found the colon bore a complete cluster of ulcerations. I heard nothing more of the malady for six or eight months, when a friend of mine,



a medical practitioner in the neighbourhood of Bristol, wrote me to say that the pigs in Clifton Union Workhouse were all dying of intestinal fever; that there was a lot of ten pigs that had taken the disorder, that six had died, and that the remaining four were not likely to recover. Next day I went over to see the patients, and had an opportunity—the only one I have had—of observing the disease in the living subject. I saw them from day to day until they had all died. And with regard to the disease in the living animal I could not give you a better idea of it than by saying that it is the exact counterpart of typhoid fever in man. The phenomena are very nearly alike. There are one or two points of difference, to which I shall presently refer; but they resemble one another very closely, only that this disorder, as in the pig, appears to be more rapid in its course, and more deadly, killing, in fact, in a much shorter time. I will say a word or two on the history of these ten pigs. They had been purchased in Bristol market about a week before the first symptoms showed themselves; and when brought to the workhouse they appeared to be in perfect health. In the course of four or five days one or two of them began to droop and exhibit signs of illness; and in the end all perished. The earliest death occurred on the fourth day from the observation of the first symptoms; but probably that was not the fourth day of the disorder. It is extremely likely that the earliest symptoms may have escaped observation, particularly in the first of the cases, and that the pig which died on the fourth day had probably been ailing for a longer period than that. However, that was the day assigned for the death of the first pig. The others died at various periods of the disorder, ranging from the eighth to the tenth, twelfth, sixteenth, and the longest-lived lingered until the twenty-sixth day. The outbreak lasted in the whole about six weeks, which it is probably important to observe. I have said that the symptoms resembled, in a general way, those of typhoid fever in man. The pig began to droop, and shivered more or less very distinctly, suddenly became very prostrate, lost its appetite, got thirsty, and seemed very unwilling to be disturbed. The master of the workhouse said he believed that in the first case of the disorder these pigs suffered from headache; and though this seems to be a curious statement, I have no doubt that it was a correct one. For, in studying two of them at that stage of the disorder, one could hardly fail, from their heavy look, the fixed way in which they held their heads, and the resistance they offered to their heads being disturbed, to come to the conclusion that they were suffering from headache. These various symptoms were generally attended by diarrhoea, which from the first was more or less profuse, and one of the leading features of the diseases. The discharges were at first of a light yellow, and strikingly resembled the light or grey yellow discharges that belong to typhoid fever in man. They became more or less of a dark green, and towards the end in many cases of a deep chocolate or dirty red colour, which tinge arose from the occurrence of hemorrhage in the intestinal ulcerations. There was another symptom; and it is important in a disease like this, where investigations are new, to fix upon outward signs that may lead to its early recognition. This symptom I regret not having witnessed myself; but it occurred in all the pigs, and I am told that it is a constant symptom characteristic of the disorder in its very early stage. I don't know on what day, but apparently it was the second, third, or fourth day, the skin of the pig between and around the ears became of a red colour, passing into various shades of purple or violet. This red tinge gradually spreads over the white surface of the animal, and is especially conspicuous on the flanks and other parts not much covered with hair; and it appears to have earned for the malady a particular nickname. Two or three pig factors visited those pigs, and they at once said, "Oh, we know this disease well enough: we call it the *soldier*," from a fancied resemblance in the skin of the pig to the military red. As the disease advanced, diarrhoea became very diffuse, the prostration increased, and I fancy that delirium intervened. The pigs seemed to me to be quite out of their mind, if one may say so. In the later stages of the disorder there is another circumstance which appears to be more or less characteristic of it. Many of these pigs became paralyzed in their hinder extremities, and so weak as not to be able to stand. The evacuations became involuntary, the weakness gradually increased, and the animal sank. So much for the symptoms during life. I do not know

that I need enter into any description of the alterations observed in the dead body of the pig. I may say this, however, that in the pigs I examined the only characteristic alterations were limited to the intestinal canal. In two cases there were symptoms of pleuro-pneumonia, or inflammation of the lung, and an effusion of lymph on the surface of the pleura; but that seemed to be accidental, and not a characteristic of the disease. The characteristic changes were entire confined to the mucous membrane in the intestinal canal; and they affect two principal types. One is the type in which the disease appears to originate in the isolated follicles, or small mucous glands of the intestines; and in that way it occurs in a scattered form. These follicles become the seat of a particular cellular formation; and that stage, which is the first stage before ulceration ensues in the stomach, is soon followed by a condition of things in which all the diseased mucous glands pass into ulcers or open sores. In the progress of the disorder these ulcers assume very peculiar characters indeed. They have been variously likened by friends of mine to different natural objects: for example, to Columba root, sliced and stuck on to the intestines; to the marks which the iron used in firing a horse produces on the skin; and to the lichens which attach themselves to the bark of trees. I am inclined to think that the disease may go to a considerable length, and yet recovery follow. In some cases, and occasionally in other parts of the same intestine, the disease, instead of being limited to the follicles, affects the mucous membrane, and an exudation or false membrane is thrown out, which lines the whole surface of the intestines, exactly as in cases of human dysentery. I think it highly probable, from what I have heard, that sometimes all the diseases of the intestines take this dysenteric type, and, instead of being in patches, consists of a continuous layer of exudation or false membrane on the surface. Now, these are all the facts that have come immediately within my own knowledge. In what I have to add, depending more or less upon the testimony of unscientific persons, I must speak with more reserve, because the subject is so very new. But if the information which has reached me can be relied upon, there are two points of very great importance in the natural history of this disorder: first, that it is virulently contagious, and second, that it is quite peculiar to the pig. I have heard of instances where it has swept away all the pigs in the homestead, as if it were a plague; yet no other creature on the farm, whether man or beast, suffered in the slightest way. So that it really seems to be a disorder that is peculiar to the pig; and a fact like that possesses very great scientific interest. The disease appears to have been known to pig factors in Bristol and its neighbourhood for a considerable number of years; but in their experience, until lately, it only occurred in isolated, or what doctors call sporadic cases. Within the last year or two, however, it has become furiously epidemic. I am almost afraid to repeat all that I have heard about it, but two or three men largely concerned in the pig trade have assured me that from ten to fifteen thousand pigs have died in the south and south-west of England of this disease in the course of the last 18 months; and if that be the case, surely it is high time that the disorder should be seriously investigated. I would here offer a speculation, but I throw it out merely as a conjecture, which I think may very likely turn out to be true as to the causes of this disease having been so rife during the last two years. Within ten or fifteen years the discovery has been publicly announced by Dr. Farr, and it has been generally accepted among the medical profession, that typhoid fever in man is much more prevalent in dry seasons than in wet—in fact, that it never becomes widely epidemic over the whole kingdom, except in very dry seasons; and the reason I believe to be this: All those contagious disorders are caused by organic poisons, which are thrown off from the body in various forms, passing by the bowels in a liquid state. In that liquid state all these poisons perish and rot very quickly. But there is a fundamental law which has never been sufficiently dwelt upon in relation to all these epidemic disorders, which is this—that when once these poisons pass into a dried state, if they can be kept dry they will retain their powers for almost any period. Thus we are all familiar with the fact that dry vaccine matter will keep good for two years. Now, my conjecture is, that the poisonous germs thrown off, in this disorder of the pig, within the last two years have passed into the dry state, and in that way been rapidly disseminated over the country. In bringing these observations



to a close I shall make one or two suggestions of a practical kind; because this is an eminently practical society, and what you want to do with the knowledge acquired here is to turn it to practical and useful purposes. I venture, therefore, to say a word or two on this subject of prevention. I have stated that, in my belief, this disease is the counterpart of typhoid fever in man. And this is quite ascertained as a settled thing, in the case of typhoid in man, that it is a contagious disorder, but chiefly propagated by discharges from the bowels. Now, if the two diseases are the analogues one of the other, the same would hold good of the disorder in the pig. I believe that it is a contagious disorder, and that it is propagated mainly by the discharges from those sores in the intestines which constitute the very essence of the disease. It is the poison which finds its way through the system of the animal, and is cast out of the system into the soil. If pigs in the early stages of the disorder are sent by steamboat they taint the steamboat. In like manner they taint the market, the sty, and the drains of the sty. The suggestions, then, which I would offer are these:—First, try to recognize the disorder in its earliest stages; second, separate the sick from the uninfected, without the least delay; third, and this is fundamental, to my mind—because, when once this disease enters a farmyard according to all testimony it never stops, but goes right through every head of swine in the place—immediately slaughter the affected animals; fourth, all these precautions will be in vain if you do not destroy the infectious discharges from the intestines of the diseased pigs. You may separate the sick from the uninfected; but if in dry weather you turn your healthy pigs at the end of two or three weeks into the sty or the yard where the others had been ill, you will find the disorder break out anew. Such are a few practical observations I would offer with regard to preventing the disorder. And now permit me to express a hope that the Royal Agricultural Society will take up this matter, and place the investigation in the hands of my distinguished friend, Professor Simonds, than whom there is no man in Europe who is more competent to conduct such an inquiry. The members of this Society have great opportunities. You know that mankind is infested by that remarkable group of disorders which are called epidemics to a fearful degree—small-pox, scarlet fever, typhoid fever, and typhus fever—a more horrible brood than issued forth from Pandora's box. Physicians have pronounced them to be inscrutable. You have in animals diseases, epizootic diseases, that are the exact counterparts of these, analogous in their nature, propagated and destroying life in the same way, and belonging to the same family. But in studying these diseases in animals you have the enormous advantage of all the problems that arise being put to the test of experimental investigation. You know that we cannot experiment upon men and women, but we can upon pigs and bullocks. I think this disorder among the pigs is one of the most interesting of the whole group; and I believe that if it were subjected, as opportunity occurs, to the test of experimental inquiry, results would come out that could not fail to be of the highest value to the agriculturist, whilst they would also possess great scientific interest in their bearing on kindred diseases in man of a far higher and a far wider range.

The CHAIRMAN said he had listened with very great satisfaction to the observations of Dr. Budd, and added that in his neighbourhood in Berkshire there had during the last few months been an immense mortality among pigs. The disease was of a most extraordinary character; and from all he could learn it developed itself without any premonitory symptoms, and carried off its victims as it were quite suddenly.

Dr. BUDD believed it probable that the disease was sometimes mortal, from the virulence of the poison, at so early a stage that, as in the case of small-pox in man the patient died without throwing out the eruptions, so a certain proportion of pigs might die in the same way, before the local disease had had time to develop itself in its characteristic form.

Professor WILSON inquired how the red tinge in the cuticle about the ears and those parts of the body which had little hair was to be recognized in a black pig. He presumed the pig-dealers must have some means of detecting it even in that case.

Dr. BUDD said the ten pigs of which he had been speaking were not black pigs, and he could not answer the question.

Professor WILSON: Because, if that were one of the easiest

modes of detecting the disease, it would, of course, be most easy to the class of men who dealt in pigs.

Dr. BUDD: If there were prostration and diarrhoea and the pigs died in rapid succession, it might at once be concluded that they had this disease.

Mr. FRERE: But would it not be possible to see the red colour in the black pig?

A MEMBER: Yes, you would see the inflammation on the skin.

Professor COLEMAN: But a reddish tinge is very common with the black pig.

Professor SIMONDS said, that although attention had been more especially directed to this disease within the last three years, there could be no question that it had existed in a form unrecognized by medical men for a very considerable time. It was in the early part of 1862 that the attention of the veterinary profession, and of himself in particular, was first called to this matter, in consequence of the virulence of the affection in the county of Berks. The first pigs he then saw were some belonging to Mr. Charles Cantrell, which would unquestionably receive the very best treatment from the time of their being born to that of their being sent to market as pork, and he confessed that when he saw them he was completely taken aback, and scarcely knew what he was dealing with. He had never seen anything of the kind before; for, although he quite agreed with Dr. Budd as to there being ulcerations in the mucous membrane, and chiefly in the larger intestines, still in this instance there was a great deposit in each membrane, and it was only by removing those deposits that he was enabled to see that there were any ulcerations.

Dr. BUDD: It was the same in my case.

Professor SIMONDS: And these deposits were like fungi on a tree, or the scar on a horse's leg after the operation of fring, or slices of the columba-root alluded to by Dr. Budd. But they were to a far greater extent than any of these similes would convey to the mind. They existed to such an extent, indeed, as absolutely to obliterate the passage through the intestine, and more than one pig died in fact from a rupture of the intestine; for the feculent matter could not pass through the colon, in consequence of the amazing amount of deposit. Other pigs showed less of these characteristics, and in those instances the ulcerations were well marked and chiefly confined to the large intestines. Very shortly after, he learnt that there was a great number of other pigs in the neighbourhood of Windsor, that were the subjects of the disease; and as a very considerable number of pigs had died in the county that year, and he had observed the affection chiefly among Berkshire pigs, he began to imbibed the notion that they were more susceptible to the disease than others. Subsequent experience had shown him the fallacy of this conclusion, and he now thought there was no difference whatever with regard to breeds of pigs, all being, in his opinion, equally susceptible, if exposed to the influence of the contagion. Suffice it that from 1862 to the present time the disease had been extending throughout the whole country, and he did not know a single county that was not suffering more or less from the affection. Certainly it existed in all the southern, midland, and most of the northern counties, for he had seen animals from all those districts. It was for this reason that in the report of the governors of the Royal Veterinary College to this society last year, the following paragraph was introduced:—"Although what may be called the established epizootics have been less prevalent, a peculiar disease in the nature of diphtheria has affected pigs in several parts of the country. This disease, however, has apparently passed its climax, and seems now to be on the decline. The sanitary measures recommended by the Professor were attended with marked benefit by keeping the malady in check; but further investigations into its pathology are required, and in this, as in other analogous cases, the governors invite the co-operation of the society." He quoted that passage from the report in order that it might be seen that the Council had not only been alive to the existence and ravages of the disease, but had been exceedingly anxious to receive information and support from the various members of the society. The disease was there spoken of as being of the nature of diphtheria, and it was so described because he had found that the deposits upon the mucous membrane, when seen in the early stages, bore a close analogy to the deposits which were seen in diphtheria (Dr. Budd: "Certainly,") and he did not see why in a diphtheroid

disease those deposits might not be in any part of the intestinal pack as well as upon the fauces. In fact, the poison might exist in various parts of the body; and he made that observation because he had seen deposits upon the pharynx, over the fauces, and upon the epiglottis, precisely in the same manner as in the human subject, again and again in pigs. This showed, at all events, that pigs were susceptible to that particular class of affections. With reference to the contagiousness of the disease he quite agreed with Dr. Budd; and, further, he agreed that probably in dry seasons it was more contagious than in wet, and for the reason Dr. Budd had explained. He found, however, that it was contagious as well in winter as in summer [Dr. Budd: "True!"]; that it made as much progress in wet weather as in dry, and that pigs differed considerably in reference to their susceptibility to the affection. In his experience the disease rarely attacked aged pigs. It had in some cases spared all the old pigs on the farm, whilst it had swept off nearly the whole of the young ones. He could not agree, therefore, that the farmer ran the risk, when his herd of pigs was attacked, of having all his pig-stock swept away. Animals that were upwards of six months old resisted the disease in a most remarkable manner. With regard to the means by which morbid matter might be propagated through the medium of the atmosphere: whether other agents might also be conductors of it he did not know; but he came to the conclusion which he had stated from the circumstance that he had seen the disease existing on hill-farms, where the country all around was open, and where there was no possible communication between that and other farms. He had seen it also amongst pigs that were kept in the best possible manner and fed upon the best possible food, and that lay in houses that could not be termed pig-sties, but might really be called parlours for pigs to dwell in. The animals were washed two or three times a-week, to keep them clean, and the greatest care and attention were bestowed upon them; they were, in fact, treated just as they would have been treated if the owner had been going to send them for exhibition to a cattle show. This was a fact of some value, because it indicated, not only that pigs, thus well managed, were susceptible to the affection, but that no conditions gave security to the animal; and especially was the fact of value when contrasted with another to which he would allude. In one of his visits to the country for the purpose of investigating the disease, he went to the neighbourhood of Henley-on-Thames, where he saw a number of pigs that were the subjects of the affection. These were chiefly young pigs that had been bred upon the farm, and of all the mismanaged animals he ever met with they were the worst. And it was plain that much must have been the case; for they were running about in the mud, and dwelling in places which were as filthy as any the imagination could picture. As soon as the young pigs had been weaned from the sow, they were fed upon bran and water. Thus were brought into operation a number of causes that must tend to produce disease and render the animals susceptible to the affection. But, curious to relate, in that particular instance the disease was not more fatal than in the case of those pigs which had been managed in the directly opposite manner. It would appear, therefore, so far as his observation went, that with regard to susceptibility, it was not management so much as age that had to do with it; but why young pigs should be susceptible, whilst old ones were not, he could not take upon himself to say. With respect to the character of the disease, he quite agreed that it was of the nature of typhoid fever; that was to say, it belonged to that class of diseases which were termed *symiotic*; and he also held that it had a close likeness to typhoid fever in the human subject. They were diseases of the same class and the same family, and belonged to each other. They bore as strong a resemblance to each other as one fungus bore to another fungus; and, though not identical, they were of the same nature. As to the duration of the malady, he was inclined to believe that it ran its course far more rapidly in the pig than typhoid fever did in the human subject [Dr. Budd: "Decidedly"]; and further, that the disease might have its beginning and ending in the course of four or five days [Dr. Budd: "Clearly"]. When, however, they got the disease in that form, it was not to be expected, on making a *post-mortem* examination, that large deposits would be formed in the mucous membrane, or very extensive ulcerations; but it would appear that the

animals were killed by the large mass of morbid matter which had entered into their organisms. It was in those cases particularly that were seen the changes of colour in the skin, which became patchy—red here and red there—especially about the ears and the upper part of the neck, but also on the back and sides. In addition to that, it would invariably be found that the membrane of the eye was intensely reddened. Sometimes, too (though that was rarer), the eye would be bloodshot. If a *post-mortem* examination were made, a patch of intense inflammation was as likely to be found in the stomach as in the intestinal canal; and when that was observable, not unfrequently there would be a thin layer of lymph, of a nasty, dirty, yellowish-white colour, spread over it, which, if scraped off, would disclose the presence of inflammatory action of the most intense nature on that particular spot. If the animal had taken a dose of arsenic, or some other mineral or highly irritating poisonous agent, the inflammatory action would not be greater. Frequently, however, there were no deposits, and no apparent change in the mucous membrane; and as examples of this, he mentioned the cases of some pigs in Bedfordshire, that had been well managed, and had died in some early stages of the affection, within the last month. Those cases were marked by effusions of blood here and there, absolutely upon the capsule of the kidney, more generally on the serous membrane of the abdomen, and likewise on the left side of the heart, clearly showing that it was a blood disease, and that the contaminated blood had left its vessels, and produced the petechial spots that had been described. Having observed the disease in that and more advanced stages, and examined all the connecting links between the two extremes, he nevertheless felt that he had a very great deal indeed to learn with regard to the true pathology of the affection. He considered that it was allied to typhoid fever, whilst analogous to and partaking of the character of diphtheria. The symptoms had been most accurately described by Dr. Budd; and it was important that farmers should early recognize its existence. There could be no doubt that in many cases the animals showed indications of headache. They were ill at ease, and he had heard it said that as soon as they were attacked, there was a peculiar pricking up of their ears. In some instances they loathed food, and in all cases the appetite was fastidious, if it were not entirely lost. The breathing was not much disturbed, and the pulse gave no sign; but as a rule the body was very hot indeed, particularly in places, and usually, not invariably, the extremities were cold. At the commencement the bowels were constipated, whatever kind of food the animal lived upon. Later in the disease, certainly on the third day, diarrhoea supervened, and it was of a peculiar character. The feculent matter having passed off, the fluid discharged contained a quantity of broken-up lymph, which was of a dirty white, and proceeded from the scabs in the intestinal canal. With regard to the discoloration of the skin of the black pig, it was difficult to say perhaps when the vessels of the skin were congested; but if the skin was particularly hot and darker than ordinarily, he thought it might be inferred that there was a determination of blood to the vessels of the skin. With reference to the duration of the disorder, he had never himself seen it protracted beyond seven or eight days. There was no doubt that it produced health speedily, and that, speaking generally, its duration was remarkably short. As to the spread of the affection from the pig to other animals, he did not think there was the least risk of that; for it was a singular fact, which science might one day throw light upon, though it had not done much at present, that there were certain victims to certain special poisons, and that a disease which would kill the ox could not be spread to the sheep, and the contrary. Regarding the means of preventing the affection, of course the sooner the disease was recognised, and the animals subjected to it were got rid of, the better. By that means a large source of mischief was cut off. Cleanliness could not be too strictly insisted upon. The places where the pigs had been kept should be thoroughly washed—floors, walls, and drains—and no sound animal should be put there for weeks after the others had left. As a medical means of preventing the disease he had found great benefit to result from the use of small quantities of a very homely remedy, namely sulphur, on account of its antiseptic action. It should be put into the animals' food twice or thrice in the week, and sulphate of soda should be used on the alternate days.

Mr. FRERE suggested that carbolic acid being an anti-septic might be useful.

Professor COLEMAN mentioned that he had been lately informed of three cases in which it had been used with advantage internally and externally.

Professor SIMONDS had had no experience of carbolic acid internally administered, though externally applied to diseases of the skin he had found it efficacious.

Dr. BUDD wished to add that he believed this particular disorder was propagated chiefly by the discharges from the intestinal canal, and that persons who got the matter about their shoes were frequently the unconscious mediums of conveying the disease from one place to another. At present, the complaint was very rife in the south of Ireland, and it was thence that vast importations of pigs took place into the port of Bristol.

A vote of thanks to Dr. Budd terminated the proceedings.

#### MONTHLY COUNCIL: *Wednesday, July 5, 1865.*—

Present: Sir E. C. Kerrison, Bart., in the chair; the Earl of Powis, the Earl of Shrewsbury, Lord Chesham, Lord Tredegar, Lord Walsingham, Mr. Barnett, Mr. Raymond Barker, Mr. Bowly, Mr. Cantrell, Colonel Challoner, Mr. Brandreth Gibbs, Mr. Humberstone, Mr. Jonas, Colonel Kingscote, Mr. Pain, Mr. Randell, Mr. R. Smith, Mr. Torr, Mr. Wilson (of Stowlangtoft), Professor Wilson, Mr. Frere, and Dr. Voelcker.

The following new Members were elected:—

Amery, P. Fabyan S., Druid, Ashburton  
Amos, James, jun., Broomfield, Herne Bay, Kent  
Arnott, Thomas Reid, 7, Mersey Chambers, Liverpool  
Ashworth, Charles, Fairfield, Manchester  
Bacchus, W. Ernest, Thorness, West Cowes, Isle of Wight  
Bennett, E. Gasking, Plymouth  
Brassey, Henry A., 56, Lowndes-square, London  
Brown, Eldred Roberts, Plymouth  
Calvert, F. Grace, Royal Institution, Manchester  
Chambers, P. Henry, Llys Meirchion, Hewllan, Trefnant  
Chase, Henry, Stanton Hall, Ixworth, Suffolk  
Chesworth, Joseph, Longauld, Market Drayton  
Clark, John Francis, Newmarket, Suffolk  
Clay, G. B., Bury St. Edmunds  
Collins, Edward, Newton Ferrers, Callington, Cornwall  
Cross, John, Broad-street, Bury, Lancashire  
Dawe, R. Henry, 7, Caroline-place, East Stonehouse, Devon  
Dickin, William, The Lloyd, Market Drayton, Salop  
Drew, James, Artiscombe, Tavistock  
Elliott, Samuel, Trafalgar-house, Plymouth  
Gowing, Richard, Ipswich  
Guy, G. Fuller, Bury St. Edmunds  
Guy, W. George, Bury St. Edmunds  
Hamblay, A., Bodmin, Cornwall  
Hervey, George H. W. Ickworth, Bury St. Edmunds  
Hicks, G. H. T., Hillgrove-house, Wells, Somerset  
Holden, Rev. J. R., Lackford, Bury St. Edmunds  
King, Edmund, Ashley-hall, Newmarket  
King, James, South Side-street, Plymouth  
Lea, James, Dodecote Grange, Market Drayton  
Lywood, Edwin, Middle Week, Andover, Hants  
May, Robert, Grendon, Tavistock  
Pike, John, Antony, Devonport  
Pitfield, John, Symonds-bury, Bridport  
Rew, James, Mount Plym, Plymouth  
Shaw, Rev. G. F. E., Edgeworth Rectory, Cirencester  
Smith, John, Deeping Bank, Crowland, Lincoln  
Taylor, T. D., Bury St. Edmunds  
Walker, E. Claudius, Chester  
Williams, Stephen, Mellington, Churchstoks, Salop  
Wyndham, Horace R., Cockermouth.

**FINANCES.**—Mr. Barnett presented the Report, from which it appeared that the Secretary's receipts during the past month had been examined by the Committee, and by Messrs. Quilter, Ball, and Co., the Society's accountants, and were found correct. The balance in the hands of the bankers on June 30, was £1,867 5s. 6d. The balance-sheet for the quarter ended June 30, 1865, and the statement of subscriptions and arrears, were

laid on the table, the amount of arrears then due being £480.

**PRIZE ESSAY.**—The winner of the prize of £20 in Class on Water Supply was announced to be the Rev. J. C. Clutterbuck, Long Wittenham, Abingdon. The papers marked "S" and "Ora et labora" were commended.

**PLYMOUTH MEETING.**—The complete plan of the showyard was laid on the table, the contractor having reported the whole of the sheds covered in, and all in readiness for the opening. Colonel Challoner reported the recommendation of the Committee that 50 tickets of 10s. each for the Public Dinner to be held in a marquee near the Hoe, at 6 p.m. on Tuesday the 18th instant be taken by the Society. The Steward of Forage having reported the failure of the green crops on which he depended for the supply of the showyard, the Secretary was instructed to call his attention to the absolute necessity of procuring some green food, at whatever distance it may be growing. The Local Committee were requested to authorise the contractor to close the show-yard immediately where the foot path crosses the yard. This report was adopted. It was moved by the Earl of Powis, and carried, that the President be authorised to present cards of admission to any officers of the French squadron expected at Plymouth, and that the President be authorised to give free admission to any men of the French squadron in their proper dress or uniform that the French Commander may think proper to allow to attend the Show.

**HOUSE.**—Mr. Barnett stated that the Committee recommended that the staircase, hall, and basement be made clean with such whitewashing and painting as may be required; that the secretary's and clerks' offices be thoroughly cleaned, and such other parts of the house as require it.

**SHOW-YARD CONTRACTS.**—Mr. Randell stated that the Committee reported that no definite reply had been received from Mr. Manning to the request that he would give the prices of offices enumerated in Report of April 4th. The Committee therefore ask for a continuation of the unlimited authority given to them in reference thereto. They regret that the powers of the surveyor appointed for the purpose of examining and reporting upon Mr. Manning's charges have been to a great extent neutralized by the Secretary having signed an agreement to pay to him the full amount claimed; and they recommend that in future no such contract be signed until it has been submitted to the surveyor. The surveyor, notwithstanding such agreement, to be instructed to report fully as to Mr. Manning's bill for the work at Plymouth. This report was adopted.

The following noblemen and gentlemen were appointed on the general Bury Committee: Sir E. Kerrison, Bart., Chairman; The Earl of Powis, Lord Chesham, Lord Feversham, Lord Portman, Lord Tredegar, Major-General the Hon. A. Nelson Hood, the Hon. A. H. Vernon, Mr. Barnett, Mr. Bowly, Mr. Bramston, the Mayor of Bury, Mr. Cantrell, Colonel Challoner, Mr. Clayden, Mr. Dent, Mr. Brandreth Gibbs, Mr. Greene, Mr. Fisher Hobbs, Mr. Holland, Mr. Wren Hoskyns, Mr. Jonas, Mr. Milward, Mr. Pain, Mr. Randell, Mr. Shuttleworth, Mr. Thompson, Mr. Torr, Mr. Wilson, and Major Wilson.

A letter from the Great Eastern Railway Company, relative to the Society's Meeting at Bury St. Edmunds, in 1866, having been read, a reply was ordered to be sent, pointing out that the Company will be clearly answerable for any accidents which may occur with an over-crowded station, and that there is ample time to take due precautions.

A communication from the Foreign Office, enclosing a

report on the growth and treatment of Flax in Belgium, was referred to the Journal Committee.

An application from the Ohio State Board of Agriculture for the Journal, in exchange for their Report was acceded to.

The following letter was read from the Society's Veterinary Inspector:—

Royal Veterinary College, Camden Town, N.W.,  
July 3, 1865.

MY DEAR SIR,—I have to report for the information of the Council, that another outbreak of small-pox of sheep has just taken place. The fact only came to my knowledge on Saturday afternoon, and I thought the matter of so much importance that I arranged to go down and see the sheep on the next day, Sunday.

The flock consists of about six hundred ewes and lambs: and up to the time of my visit, 17 animals were known to be affected, and it was hoped that my examination would not materially increase this number. Such, however, did not prove to be the case, for no less than 48 were found by me to be diseased to a greater or less extent, thus bringing up the number of infected animals to 65.

The outbreak has most unfortunately occurred on the Sussex Downs, amidst large flocks of sheep. The parish is called Southsease, and is within a few miles of Lewes, between this place and Newhaven.

I need scarcely say that I shall spare no pains to arrest as

quickly as possible the progress of this fatal disease. On Wednesday morning I go down again, and in the meantime I am in communication with the owner and the resident veterinary surgeon.—I am, dear Sir, yours truly,

H. Hall Dare, Esq.

J. B. SIMONDS.

The Council then adjourned to Tuesday, the 11th July, at 12 noon, for the election of Members.

ADJOURNED MONTHLY COUNCIL: July 11th, 1865.—Earl Cathcart in the chair.

The following new Members were elected:—

Alexander, R. C. B., Douro House, Yalding, Staplehurst, Kent  
Baring, The Hon. Alexander, Buckingham, Brandon, Norfolk  
Bishop, James, Looe, Cornwall  
Bowers, Henry Richard, Abbott's Lodge, Chester  
Fox, Charles, North St. House, Plymouth  
Hansell, Septimus, Marton House, North Shields, Northumb.  
Hicks, Richard, Hartley Lodge, Plymouth  
Mansford, J. E., 23, Ker Street, Devonport  
Morley, The Earl of, Saltram, Plympton, Devon  
Badcliffe, Copleston Lopes, Derriford, near Plymouth  
Badcliffe, Colonel Pollerfen, Warleigh, near Plymouth  
Ricketta, James, Frocester, Stonehouse, Gloucester  
Simes, Nathaniel Phillips, Strood Park, Horsham, Sussex  
Stapilton, Major H. Miles, Myton Hall, Boro'bridge, Yorks.  
Thompson, Henry, Organsdale, Kelsall, Chester  
Willoughby, Wm., 3, Clarendon Terrace, Plymouth.

## HAY AND STRAW ELEVATORS.

### MODERN ENGLISH ELEVATORS.

Our modern "Jack Straws" date from the commencement of the present century. In 1795 Mr. Wigfull, a millwright of Lynn, took out a patent (No. 2055) for a portable thrashing machine, which specifies "an endless web" for taking the unthrashed corn into the machine. Arthur Young, Esq., in his Survey of Norfolk, published 1805, tells us that this patentee erected numerous thrashing machines in that county; but how far he improved upon the specifications in his patent we are not told. The same writer, however, informs his readers that "Mr. Whiting, of Fring, has a large thrashing mill built by an engineer from Scotland, Mr. Fordyce. It cost him £200, is worked by six horses, thrashes 24 coombs of wheat in the day, 55 of barley, and from 63 to 84 of oats. It has five beaters on the drum-wheel, and the fluted segment of a cylinder which covers the drum in two parts, with an unfuted plate between them, which is raised or sunk by a short lever. This is to guard against stones getting in. In another circumstance it is also singular: there is a long platform with a rolling cloth bottom, the whole raised or sunk at pleasure, for delivering the corn across the floor space of the barn, from the goff in which the corn is stacked, to the other end in which the mill is built, which saves much labour and works to his satisfaction."

This is evidently an endless web elevator on Wigfull's principle, raised and lowered by means of pulley tackle from above. As the goff or mow was thrashed, it would be lowered; and when the whole was finished, it would then be raised up, to permit of the carts getting in below, or the process of stacking if the carts and waggons were only backed to the barn door. It is but proper, however, to observe that the novelty of Wigfull's endless web is claimed by Scotch millwrights, but with what justice we must leave our readers to determine.

About the same time, or the beginning of the present century, Mr. Gladstone, a millwright of Castle Douglas, invented his "travelling shaker" for the twofold purpose of more effectually shaking the straw and carrying it to the straw barn or straw yard. In Galloway, as in many other parts of the north, the harvests are often wet and late, so that the corn has frequently to be stacked and thrashed with a degree of moisture that renders it difficult to separate the grain effectually from the straw. Hence the object of the travelling shaker. Mr. Samuel Smith, in the appendix to his "Agriculture of Galloway," published in 1810, gives a

drawing and description of this machine, which may be considered the first of the modern "straw elevators," the previous example being the first of the sheaf elevators. Loudon, in his appendix to the second edition of his Encyclopedia of Agriculture, gives a drawing of a thrashing machine having one of these "travelling shakers." About this time Mr. Gladstone did much to improve the thrashing machine, and both of the above authors justly observe that his merits in this respect have not been sufficiently appreciated by the agricultural public. The former (Smith) in speaking of his straw elevator says, "Travelling shakers, invented about six or seven years ago by Mr. Gladstone, are now common in Galloway, and are found a very useful appendage to the thrashing machine, as they convey the whole straw into the straw yard, having first separated the grain from it more completely than can ever be done in the common way." And the latter (Loudon), in his Encyclopedia of Agriculture (p. 1322, article 8202), in giving a description of a thrashing machine, erected by Mr. Gladstone in 1805, says among other things, "It is adapted of itself to separate the straw from the corn, and convey it perfectly shaken into the straw barn, to clean the corn effectually, and to lodge it securely in the granary."

In construction Gladstone's travelling shaker is simple, consisting of two endless flat buckle chains, with cross rods of wood between them, working over two pairs of pulleys, the whole forming an endless slotted web, with the one end so placed as to catch the straw as it falls from the common shaker, the other or elevated end being over the mow in the straw barn, or extending out into the straw yard. In order to give it a sharp vibratory shaking motion on the upper side, so as effectually to separate the grain from the straw, a small roller is fixed on the end of a lever, the other and longer end of the lever being actuated by the teeth of a spur wheel, worked upon the under side of the travelling web, every tooth of the spur wheel lifting the lever, and thus giving the web a sharp upward stroke on the under side. Advantage was taken of the lower portion of the travelling shaker to bring back the whole of the unthrashed ears of corn, and cavings thus separated from the straw, to a second elevator, which conveyed them to the machine, so as effectually to thrash the ears of corn that had passed the beaters the first time.

The "Encyclopædia Britannica," seventh edition, 1848, in alluding to the improvements made upon the thrashing machine since the previous edition, says: "One of the most useful of these, perhaps, is the method of delivering the straw, after it has been separated from the corn, by the circular rake, to what is called a 'travelling shaker,' which carries it to the straw barn. This shaker, which revolves like the endless web formerly used for conveying the corn to the beaters, is composed of small rods, placed so near each other as to prevent the straw from falling through, while any thrashed corn that may not have been formerly separated drops from it in its progress, instead of falling along with it, when it would be trodden down and lost."

The straw elevators referred to above, constructed by Mr. Gladstone and others in the north, were almost exclusively in connexion with fixed thrashing machines; and the same may be said of the sheaf elevators erected by Mr. Clyburn and others in the south and west, noticed in Morton's "Cyclopædia of Agriculture." Up to 1846 we do not recollect of having met with a single example of one in connexion with a portable thrashing machine. True Wigfull's was a portable machine, and not a few have contended that he used a straw elevator for delivering the straw, as well as a sheaf elevator for feeding the thrashing apparatus; but when recently in Norfolk in search of information on this point, we found no old farmers or millwrights who had seen a single example of the kind in actual use. Under such circumstances, the advisable course is to leave the question of priority of invention an open one for future solution.

At the meeting of the North Staffordshire Agricultural Society, held at Leek, in 1846, Mr. John Cornes, of Market Drayton, Salop, exhibited a small portable thrashing machine in operation, worked easily by two small ponies. This machine had a combined shaker and straw elevator, for which he obtained one of the highest prizes given by the above society. Next year at their September meeting, held at Uttoxeter, in 1847, the same society awarded Mr. C. another prize for his machine. In a short time there were several of them in successful operation in the counties of Shropshire and Staffordshire. Prior to the Staffordshire Show it was exhibited at the meeting of the Royal Agricultural Society, held at Northampton, in July of that year (1847), at which exhibition we had the pleasure of seeing it. Upon its merits opinion was there somewhat divided, the majority of those with whom we conversed thinking it ahead of the current generation, consequently the agricultural press took little or no notice of it: the political press was too deeply absorbed in the general election of that year to spare a paragraph on the introduction of what may be termed a promising novelty in agricultural mechanics. The *Staffordshire Advertiser* of Oct. 5, 1846, in its report of the implements shown at Leek, gave it greater prominence. Thus it says, "Among those who gained prizes, we may mention Mr. John Cornes, for a diminutive thrashing machine, worked by two ponies, giving them power, it was said, by its peculiar construction, equal to two horses, and capable of being altered into a hand machine for two men." This is brief, but practical and conclusive.

Into the general mechanical merits of Cornes' thrashing machine we do not enter, our observations being confined exclusively to that portion of it acting as a straw elevator, and which closely resembles that of Hayes of Elton, when first exhibited; so much so, that the two may be said to be identical in principle of mechanism. Recently the latter has adopted Whitworth's principle of an endless rake, raking up an incline plane—a totally different principle from that of a toothed endless straw carrier and elevator. The peculiar novelty in Cornes' elevator consists in the teeth upon the cross-bars, and its adaptation to a portable thrashing machine. In other respects it is similar to the straw carriers and elevators of the fixed thrashing machines, some of which were also toothed, when the angle of elevation was great, the spikes being very short, so as to part with the straw more freely.

At the Yorkshire Agricultural Society's meeting held at Scarborough in August, 1847, Mr. Isaac Hodgson, of Snainton, exhibited "a four-house portable thrashing machine with straw conductor;" but, up to this date, we have received no answer to inquiries relative to the peculiar mechanism of this straw conductor.

We may also mention in this place that we are informed

there is a toothed straw elevator in Australia, which takes the precedence of Cornes' one, as to the priority of discovery. Indeed, the "traveller band" of the next example, both toothed and plain, have been well known in the United States since 1838, and to engineers generally in this country.

Leonard Wray, Esq., in his "Practical Sugar Planter," published in 1848 by Smith, Elder, and Co., Cornhill, London, and for which he obtained the honorary medal of the Society of Arts, purposes conveying bundles of sugar-cane and other agricultural produce by means of an endless rope actuated by a traction engine. In paying Alexander McRae, Esq., a favourable compliment for his successful introduction of steam culture into British Guiana, he purposes simply an extension of his plan. Mr. McRae used his engine in a punt in one canal, and his anchor in another punt in the canal on the opposite side of the land to be cultivated. Mr. Wray proposes making a traction engine do all the work upon the plantation, and, in order the better to convey the details of his practice to his readers, he gives a drawing of a traction engine at work hauling a plough by means of an endless rope or band, the plough being easily attached or detached while the rope is in motion, on the same principle of mechanism as in the "windmill plough," exhibited at work by Stace and Vallance at the Royal Agricultural Society's show held at Newcastle-upon-Tyne in 1846. His endless rope works upon two vertical pulleys, the one at the engine, and the other at the anchor or "assistant" as he technically calls the anchored pulley with its carriage. Having thus given a general outline of Wray's traction engine and tackle, we shall quote from his invaluable work (page 119) his method of conveying and elevating bundles of sugar-cane and other products of agriculture:

"For instance, in bringing canes out of the field to the cart in the road, the endless band has in this case bundles of cane hooked on to it, by a peculiar and very simple arrangement; and, as it travels slowly onward, it carries the bundles to the engines; on arriving near which, they are successively struck off, and fall on to another small 'traveller band,' which carries them on to the waggons immediately behind the engine.

"Thus from the time the endless band is set in motion until the waggons are loaded there is no stoppage, but the band travels slowly onward, the cane tyers hitching on their bundles as they get them ready, so that the delivery is constant. When the waggons are all loaded with cane, the engineer stops the machinery, disengages the band, throws the drum out of gearing and the engine wheels into gearing, then attaches the engine to the waggons, and proceeds with them to the mill house, where they discharge their canes, and return laden with 'green trash' to the field. Arriving at its original position, the engine again receives the endless band, by means of which the green trash is sent throughout the field wherein men and boys are stationed at regular distances to strike off the bundles in rotation. Immediately the waggons are emptied, the men hurry back to their cane tying, leaving the boys to distribute the trash along the trenches. The engine and assistant then move on a few paces to a fresh position and recommence the operation of bringing out canes and loading the waggons. In this manner the endless band moves on over the whole field, bringing out the canes and returning the green trash as it proceeds. To expedite the work and render it more easy it would be desirable to have a number of cane ties or bands, which are nothing more than pieces of half-inch rope, about three feet long and tarred, with iron hooks or rings at each end for tying the small bundles of cane (tied with cane leaves) together into large bundles, for transmission by the endless band to the waggons. Some of the same kind, but longer, would be very useful for tying up the cane trash as it comes from the mill, so that the waggons might take it in bundles to the field and pass it along at once without trouble or detention. Sand and manure of all kinds could thus be more cheaply brought and distributed over the land than by any other method."

The "traveller band," for loading and stacking, quoted by the author of the above extract, is evidently one of those well-known in this country and in the United States of America, as they were extensively in use long before the date of his work (1848), the first English patent being Wigfull's (1795), and the first American one Beebe's (1838). It must either have had "spikes," projections, or "cradles" upon it, otherwise the bundles of cane would have rolled off downwards. But into practical details of this kind we

need not go. From an engineering point of view, cradles, spikes, and projections upon a traveller band are simple questions that resolve themselves into the angle of elevation that the bundles, sheaves, loose corn or straw have or has to be elevated, questions that have practically been solved many times over since the commencement of the present century without any claims to *discovery*.

In 1852, John Caborn, of Denton, Lincolnshire, took out a provisional specification (No. 738) for an endless web shaker and straw carrier, but the invention did not proceed to the great seal.

In 1853, Mr. Joseph Burch, of Cray Hall, near Macclesfield, in the county of Chester, carpet manufacturer, took out two letters patent (Nos. 1155 and 1156), the former for "*certain improvements in machinery for reaping, loading, stacking, and storing grain and other agricultural produce*," and the latter "*certain improvements in machinery applicable to thrashing, winnowing, cleaning, and sorting grain, and to other agricultural purposes*." Both are dated the 24th December, 1853, and sealed the 2nd April, 1853, and in each the elevating apparatus is similar, consisting of endless cloths, webs, or racks. In his provisional specification (No. 1156) he says, "My improvements in loading, stacking, and storing grain and other agricultural produce consist in the use of endless racks, webs, or cloths, which being stretched upon rollers and attached to a wagon or cart, or placed in a barn or rickyard, will be made the means of lifting, moving, stacking, or storing the produce." The specification of No. 1156, relative to straw elevators, is similar.

Of themselves, apart from their combination with the rest of the machinery patented, Caborn's and Burch's elevators are without novelty, the patentees being evidently ignorant of what Wigful, Gladstone, and others had done before in this department of agricultural mechanics.

On June 2nd, 1863, Mr. Joseph Whitworth, engineer, Manchester, lodged a provisional specification (No. 1349) with the Commissioners of Patents, for improvements in machinery for cutting and harvesting corn, grass, and other crops, which includes a hay and straw elevator. The inventor says: "The fourth part of my invention consists of a machine

for loading hay. A frame is mounted on two wheels; to this frame are attached the bearings of a pair of rollers, one of which is near the ground, and the other near the top of the frame. An endless chain or band, working in an inclined direction, furnished with rakes or collectors, passes over these two rollers; and when the machine is in motion, the collectors in passing along the ridges raise the hay from the ground, draw it up an inclined plane or carrier plate fixed to the frame, and deposit it in a suitable receptacle. This receptacle is made to revolve slowly, so that the hay may be equally distributed within it. The receptacle is so constructed that it may, when full, be transferred from its carriage to the stack, and deposit its contents at a single operation.

"The receptacle may be dispensed with, and that part of the machine, consisting of the endless chain or band, rakes and inclined carrier plate, may be applied to, and deliver the hay into an ordinary cart."

On the day following Whitworth's viz., June 3rd, 1863, Mr. Jas. Hayes, of Elton, Hunts, took out his patent (No. 1369) for "Improved machinery for raising and stacking straw, hay, corn, and other agricultural produce." In principle the elevating apparatus is similar to that of Cornes's combined shaker and elevator, as already stated.

This project has been extensively worked, not on the principle on which it is patented, but on that of the preceding one (*i. e.* Whitworth's project). How far a patentee is justified in thus dropping his own project, and in taking up that of another, which has become public property, and in charging licences and royalty of others for the same, we must leave our readers to determine. And what renders the question none the less singular (if anything can be singular in patents) is the fact that, before Mr. Hayes made the change, the Messrs. Tuxford and Sons, of Boston, took out a patent for improvements on Whitworth's endless rake and inclined plane, only claiming the improvements they effect, viz., the scape doors in the bottom of the "carrier plate" or inclined plane with some other things to which they are justly entitled. In point of fact the Messrs. Tuxford and Sons are the first who used the endless rake and inclined plane elevators with portable engines.

ENGINEER.

## STEAM POWER.

### THE NEWCASTLE "BEST APPLICATION."

Much has been said (and no little doubted) concerning the "so-called" eight-horse set of steam-ploughing tackle, which, at (and since) the Newcastle meeting, has astonished a good many people by its performances. Wherein did the Fowler engine differ from others, that it could turn over as much ground as a twelve-horse engine formerly did? Would the "twin" system really answer, so that a couple of eight-horse powers, operating simultaneously, might even surpass the rate of work hitherto accomplished by two great fourteen-horse powers hauling alternately? These and other questions have been freely raised; and we propose, in this paper, to tell inquirers "all about it."

At the Peterborough meeting, the other day (namely, Wednesday, the 5th), we found these wonderful engines on a farm at Dogthorpe, some three miles from the showyard. The field was tolerably level; the soil, a loam with some little gravel; and our estimate of its tenacity was, that 5 or 5½ inch deep ploughing would be fair pair-horse work. As to the quality of tillage done, all we need say is that the five-furrow plough, with digging-breasts on, smashed up the ground in its own effectual style, completely cutting the whole bottom, and shifting the broken earth sideways to let you see that it has done so, while leaving an upper surface in the best possible state of separation and exposure for the natural and mechanical after-process of cleaning and fertilisation. The four-furrow

turn-over plough also made some excellent work, just suited for a clover-ley intended for wheat. Our object, however, being to see the full power of the engine exerted, we asked for a specimen of quick action—no matter about a little lack of neatness in tucking the alices together, and leaving a smooth, sharp angle-edge. This is what we ascertained: One engine alone (working with an anchorage at the opposite end of the field) ran with ease, at almost any number of revolutions per minute, hauling the four-furrow turn-over plough at the ordinary brisk pace, when the steam pressure was 75 to 80lbs. per square inch: when the gauge-index sunk to 60lbs., the plough proved too much for the engine, and advanced very slowly. And the engine kept up this powerful hauling for any length of time without flagging, though the furrow was 320 yards long, and the interval of rest "at the ends" very brief indeed. From the depth of the furrows (about six inches), we considered that each furrow would have proved heavy continuous work for two horses; so that one of the "eight-horse" engines is capable of pulling an implement with a draught equal to that of eight horses, besides working the rope and anchorage, and advancing at intervals along the headland; and this with a speed of the implement considerably faster than that of an active farm-horse's walk. How rapidly one engine could pull the plough we did not ascertain; but, from the high number of strokes per minute, it was evident that

the engine was equal to a much harder task, if required. The occupier of the land had imposed a limit on the depth of furrows; but, as the engine is constructed to work up to 100lbs. pressure (that is, 20lbs. to 25lbs. more than was used in drawing the plough), it is evident that the engine could have managed another inch or two in depth (what would be three-horse ploughing) without slackening the rate of work done. Very heavy tillage would require only the removal of a plough-body, so as to drive three furrows at once. The conclusion is, that for all ordinary purposes, and on all soil but the most tenacious clay, one of these "eight-horse" single-cylinder engines will suffice—at any rate, as well as the double-cylinder ten or twelve-horse engine hitherto employed.

That this is not over-stating the capability of these little engines appears from an observation made of their performance when both were operating in conjunction. The anchorage being removed, the rope was passed round the clip-drums of the two engines, standing at opposite ends of the furrow, and each advancing along the headland at a completion of a round. For the first few yards at starting and the last few yards at finishing the furrow, only one engine is exerting any power, the mode of working being thus: The engine nearest the implement starts it, and then whistles for the farther engine to be thrown into gear; when the plough approaches the farther engine, that engine whistles, and the first engine shuts off steam. So that, with proper attention to the sound of the whistle (or to the visible puff of white steam, when the wind is blowing wrong way for the sound), no accident need happen from the distant engine pulling the implement into the drum or fly-wheel of the other. The plough travelled from end to end of the furrow (about 320 yards) in an average time of  $1\frac{1}{2}$  to  $1\frac{3}{4}$  minutes—that is, at a pace of 7 to 8 miles an hour! (the lads running full chivy after the rope-porters)—such a speed as we never before saw in steam tillage. In fact the engines were so much more powerful than the work demanded, that they ran with tremendous velocity, probably much over 200 revolutions per minute (though this was not counted). Yet the plough cut four  $10\frac{1}{2}$ -inch-wide furrows at once, about 6 inches deep—good pair-horse draught to each furrow. The slices, of course, were much broken in turning, at the high rate of speed. The average time occupied between arriving at the end and again starting was one-third of a minute (Noddings, the manager, assured us that at Cologne the changing was done in 8 seconds); and the result, brought out by a little process in arithmetic, is that the rate of work was  $2\frac{1}{2}$  up to nearly  $2\frac{3}{4}$  acres per hour, or no less than 25 to 27 acres per day of ten hours. We are not going to declare that this pace could be maintained hour after hour, but we timed the operations for several rounds in succession, and observed that the steam pressure continued pretty steadily at 75lbs. all the time: the engines were by no means "losing breath," or wanting a pull up "to catch their wind." But our readers may lose *their* breath if we go on talking of 27 acres a-day of pair-horse ploughing, with a four-furrow implement and a brace of single-cylinder eight-horse engines. We may affirm our belief, however, that the power expended might have easily driven a cultivator, smashing up 7 feet breadth of hard ground 7 or 8 inches deep, say at half the above pace, which would accomplish about 8 acres per hour, or 30 acres per day. The wide tool not being on the ground, we had no opportunity of actually trying the experiment.

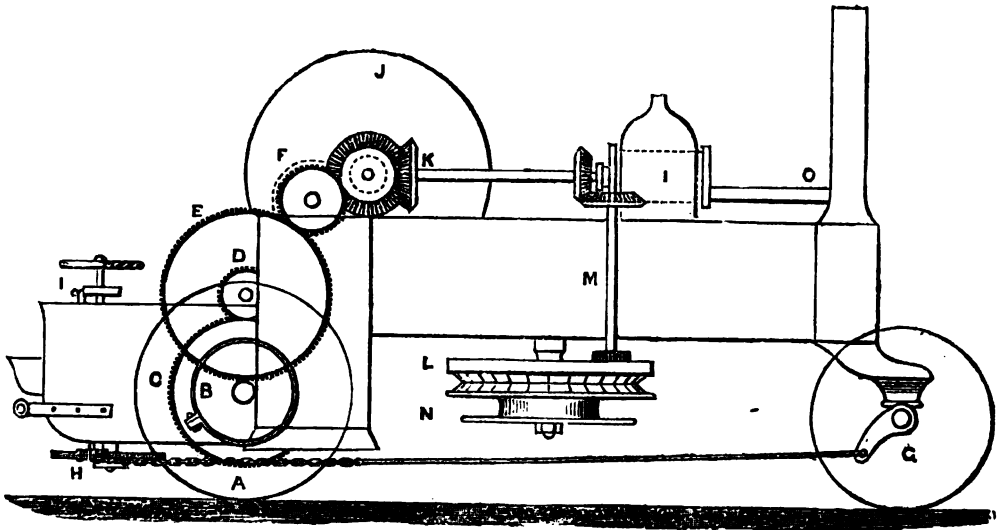
It is clear that, while these engines possess extraordinary power, the system of working them simultaneously has been fully mastered: the two clip-drums act well together; both engines can put forth all their strength in hauling one and the same implement; and no difficulty is experienced in manipulating the two motive-powers at

starting and stopping. The merit of the engines is their amazing power in proportion to their bulk, weight, prime cost, and consumption of fuel and water. And we must now explain the secret of their muscular and economic virtues:

Each of the engines is said to be an "8-horse," because it has only one cylinder, and this is of  $8\frac{1}{2}$  inches diameter, and 12 inches stroke. Then, is the steam of enormously high pressure, 200lbs. or so to the inch; while the gauge and the valve-spring make-believe to the contrary? No: it does not appear that the steam in the boiler has a greater pressure than 70lbs. up to an extreme limit of 100lbs. per square inch. At any rate, whoever brings an 8-horse set of tackle from Leeds is assured that his engine will be of precisely equal power to one of these; as the firm does not make different engines for racing and for regular use, and they are quite willing that any engine in process of construction at their works should be selected for public trial. There is only one slide-valve (worked by a link motion for the purpose of reversing), and the steam is cut off at about the same part of the stroke as in ordinary portable engines; the valve and parts, however, are very wide, admitting a full charge of steam when running at a high velocity, whereas common valves check the ingress of steam (not giving it sufficient time) when working at great speed. The engine, therefore, is constructed to run at a high number of revolutions per minute—that is 140 up to 200; a small cylinder being able to do as much work as a large one, provided the piston move faster and the supply of steam be kept up. What sort of boiler, then, makes steam enough for this rapidly-running 8-horse engine? Well, there is nothing disproportionately big about it. Of course, it has strong plates, a capacious fire-box, plenty of grate surface, and numerous stays, adapting it for its normal pressure of 70lbs. to 100lbs., and for standing the racket of travelling. The boiler is of  $2\frac{1}{2}$  feet diameter, and of considerable length, namely, 8 feet between the fire-box and smoke-box. Opening the smoke-box door, we counted thirty tubes of ordinary calibre: their length (8 feet), gives a large area of heating surface; and their ends next the smoke-box are not so hot as the ends of shorter tubes would be. This not only economises fuel, but gives greater safety to the boiler when working upon a steep incline and so exposing some of the tube ends above the water level. Another source of the abundant power besides this unusual length of boiler is, a lofty steam-dome; and as the steam is taken by the steam-pipe from the top of this dome, it is peculiarly "dry" (as the engineers call it). To keep the cylinder itself hot, it is supported on one side of and partly within the dome, while the outer side of the cylinder is surrounded by a steam-jacket. The steam-dome is placed toward the smoke-box end of the boiler, so that when an unusual depth of water covers the fire-box (as in ascending a hill), the mouth of the steam-pipe is still higher above the water-level, and "priming" is prevented. In working upon a sloping headland the practice is to have the fire-box end lowest; and when a headland lies over a hill or dips into and out of a valley, the engine is turned round end for end for the descent, in order to preserve this low position of the fire-box. Slight elevations and depressions do not much affect the angle of position of the boiler, as the hind-wheel axle and front-wheel axle are  $12\frac{1}{2}$  feet apart.

Our diagram will convey a notion of the arrangement of the various parts of the engine. A, the hind-wheel, is 4 feet 10 inches in diameter, with a 16-inch felloe, diagonal plates of iron across the felloe enabling the wheel to lay hold of the ground and avoid slipping: the hind-wheels being the propelling wheels for travelling. The axle is made much stronger than heretofore; and instead of





being hung in stud-bearings, it is supported in a broad continuous bearing upon the fire-box. B represents one of the friction straps or brakes, by which either of the hind-wheels is set fast with the axle, for driving either one or both wheels at pleasure. The axle carries a strong spur-wheel (c), gearing with a smaller spur-wheel (d), on an intermediate shaft; these wheels being on the farther side of the engine, and inclosed in a case from mud and road gravel. On its nearer end the intermediate shaft carries a large spur-wheel (x), driven by a smaller spur-wheel r, upon another intermediate shaft, this wheel being driven by a pinion upon the engine crank-shaft. In order to command two different speeds of travelling, this upper intermediate shaft carries a larger spur-wheel at its further end (indicated by the dotted circle), gearing with a small pinion upon the further end of the crank-shaft. Either of the pinions on the crank-shaft is put in or out of gear by sliding it along the shaft. The gear work is so timed as to give an advancing pace of  $1\frac{1}{2}$  miles per hour, or of  $2\frac{1}{2}$  miles per hour, when the engine is making 140 revolutions per minute. Seven toothed wheels may appear many for the locomotive action; they are certainly not so simple and light as an endless pitch-chain. But the manufacturers declare that they are the only people who ought to object to these wheels, the expense of making being great, but the durability of the machinery very much enhanced. All the bearings can be readily oiled without the engine-driver leaving his box. The pair of front-wheels (e), are of 3 feet 10 inches diameter, with 14-inch felloes; the backing of the fore-carriage is managed by a couple of rods terminating with a piece of pitch-chain, this being worked by a wheel and pinion movement (H), underneath the water-tank and coal store. By a small strap or brake (i), the angle or direction of the steering wheels may be preserved invariable when required. As we are now describing the traction part of the engine, we may add that the extreme breadth from out to out is  $7\frac{1}{2}$  feet; the total length about 17 feet, and the weight stated to be about 7 tons, though this is not accurately ascertained. The steering is quick and effectual; sharp angles can be turned; and with the slow pace of  $1\frac{1}{2}$  miles per hour the engine is well able to lift herself out of deep holes or "progress" through a soft soil.

The cultivating parts are very simply arranged.

The steam-cylinder is shown at i; o is the exhaust-pipe; and J is the fly-wheel upon the crank-shaft. Motion is communicated to the clip-drum (L) by two shafts, x and m, driven by two pairs of bevel-wheels; the pinion at the bottom end of the upright shaft gearing with internal teeth upon the flange of the drum. The action of the clipping-pieces of the drum in receiving, gripping, and releasing the rope, we need not describe here; nor need we do more than mention that the lower drum (x) is for winding up the rope and carrying it for travelling. Not to miss details, we should add that a couple of guide rollers sustain the rope in front of the clip-drum; while two small discs are pressed by springs into the groove, to prevent the rope dropping out. The rollers are so hung upon moveable bracket-arms as to permit hauling at almost any angle of direction. One valuable improvement has been made in the clip-drum. To give any desired amount of pinch, the upper and lower flanges (respectively carrying all the upper and lower clips) must be so connected as to allow of their being set closer or further apart; and this was at first done by means of bolts and nuts at various points around the circumference of the two flanges. The objection was that one nut was liable to be inadvertently screwed more than another—thus nipping the rope too tightly in one place and not enough elsewhere. Now, however, the peripheries of the flanges have been threaded like screws, and screw together; so that by turning the lower flange a portion of a revolution while the upper flange is stationary, the two flanges are brought slightly nearer together or slightly further apart—the pressure of all the clips being thus simultaneously adjusted with the utmost nicety.

The advantages of the "twin" engine system are very obvious. You obtain a *maximum* result for the coal and water expended, the rope being held more tightly, and therefore better carried and upon fewer porters than in the engine and anchorage system. You save the long time that is always consumed in setting-down and taking up an anchorage. The engines are well adapted for ploughing by contract, and working thrashing-machines, &c., when not wanted in the field. More particularly are they suited for a joint-partnership of two to four farmers; the engines can be thrashing at two different farmsteads when not cultivating. In some cases an anchorage may be employed with one engine for light operations, and the



second engine be called from its thrashing, sawing, &c., when heavy or urgent tillage may demand it. The superiority of two light engines to one ponderous engine, of equal power to both, is also great in point of portability where deep lanes or soft sticky clay fields abound.

Price is an important point in the merits of a steam plough, so that we shall here add the money figures from Messrs. Fowler's trade catalogue. The price of the eight-horse engine, arranged simply as a traction-engine or road

locomotive (but so that the hauling drum, &c., can be attached at any time), is £390, with £30 extra for the double speed; when fitted for ploughing, £480; and the anchorage, three-furrow balance plough, 800 yards of rope, and 20 porters, bring the total cost up to £698. The double-engine set, for working on the "twin" system, involves just the cost of another engine—that is, a total of £1,168.

J. A. C.

## THE OUTCRY ABOUT MEAT.

Nothing could more clearly point out the lamentable want of intelligence on matters agricultural which exists in the minds of townspeople than the present outcry about the high price of meat. Meetings in various parts of the country have been held to consider the question, and in London almost everybody is grumbling about the same thing; whilst Messrs. Cubitt's men struck the other day for higher wages, the two reasons given for the step being "the increase of house-rent and the high price of meat." We have long since ceased to wonder at anything London citizens may believe or say about agriculture, or the production of anything by farming; but it does seem passing strange that men in provincial and agricultural towns, where they may have the opportunity of seeing and learning something about farmers and farming, should be so thoroughly uninformed as to conclude that the present cause for complaint is to be attributed to a monopoly organized by butchers and farmers. The simple fact is, so much nonsense about farming has been written and spoken of late years, and so many plausible theories have been started by one character and another, and these have been taken up and enlarged upon in the penny papers which cater the intellectual food of the artisans, mechanics, and more humble labourers, these poor fellows now really believe meat cannot possibly be dear except it arises from a monopoly on the part of the producers and retailers—the farmers and butchers.

We have now before us, however, higher and bigger game than penny sensation clap-trap mongers. In the courtly and authoritative *Globe* of Wednesday last we have the following hackneyed argument used as the opening of the second paragraph of a "leader":—"While we are perfectly ready to acknowledge some inconvenience in this state of things, we by no means contemplate it with unmixt dissatisfaction. Dear meat in prosperous times, in good seasons, and with free trade in cattle, can mean nothing else than that demand is outrunning supply, *not because supply is falling off*, but because demand is increasing with strides too prodigious for supply to keep up with it." It is difficult to preserve the serious vein of mind required to deal with a subject of this kind, when we find any one who is entrusted with the responsibility of leader writing for the *Globe* making such a figure of himself as this quotation points to. Either this writer must be taking up a subject which he has the merest smattering of information upon, or he must be wilfully perverting observations and facts to serve some supposed end, the which we will refer to no farther than to say it may belong to the excitement which was then, and is now, going on in most parts of the country. The conclusion there come to is almost completely erroneous; for nearly the entire cause for the present high price of meat is due to the *falling off* in the supplies of cattle in this country. This result has been foretold for years by a large number of intelligent, sagacious, and far-seeing, but unassuming and unpretending agriculturists. It would have come five, or six, or seven years ago, if it had not been for the war with Russia in the Crimea, which caused corn to rise to a high price, and capital therefore to flow back into the hands of farmers, which enabled them to hold their live stock and increase it, instead of forcing it into market half-grown and half-fat at certain seasons, that they might meet their fixed expenses. It would be the height of folly to finch at this question. If the farmers would be placed in a better position, and the public as consumers would be better served, this subject must no longer be allowed to be glossed over and botched up as the *Globe* is now doing, and other

daily papers have done; but the bull must be taken by the horns, and turned over and over and upside down, till our present position is made perfectly clear, not only to the *Globe* and the other daily papers referred to, but to the whole community.

But let us make another quotation. In the next paragraph, which we give entire, the writer in the *Globe* has crammed a dozen crude ideas into words, in the most extraordinary heel-over-head fashion that could possibly be done:—

"But there is nothing to be done except to leave things to themselves—at least nothing by legislation or artificial interference. The demand has stimulated the price, till the price begins to quell the demand. But the price has a double action: it operates also on the supply, though of necessity not so quickly as on the demand. Beef and mutton cannot be created in a day. For a time they must be dear, in order to repress the avidity of too many consuming mouths. But only allow time, and all the mouths shall be fed; and moreover prices in the end will very likely fall even to a lower average than has been hitherto maintained. *Already farmers are considering the expediency of replacing arable lands by pastures in counties where they cannot grow corn at remunerative rates.* Corn can always be imported to compete with home produce, but there is a difficulty about importing meat. The dried South American beef hardly pleases the English workman when prosperity comes to him."

Of the "legislation or artificial interference" here mentioned we have nothing more to say than that we suppose the writer refers to the suggestion made by a wisacre, a few days since, in a morning contemporary, and which was to the effect that the killing of calves and lambs should be prohibited by law. If this be so, this is about the only sound conclusion this writer has come to; for, considering the way in which capital has been lost by agriculturists in a large majority of instances, if the sale of fat lambs and fat calves were prohibited, men who are so situated regarding cows and ewes as to depend on these returns would necessarily be placed in the same position as silk weavers would be if their looms were stopped, and they were ordered to stand still, or spin cotton, that the poor might buy. But if our supposition be not what was intended, then this conclusion is as ill-founded as is the article throughout.

The pith of the above, however, is in the sentence we have *italicised*. This is just one of the specimens of the "learned ignorance" by which the upper and middle classes have been addressed for years past by such writers as we have referred to. This reference to "replacing arable lands by pastures" is evidently intended to convey the opinion that the high price of meat is causing farmers to turn more attention to growing meat than corn, and to do this by turning arable lands into grass fields! But if this writer had known the most elementary principles of practical agriculture, he would have been aware that a far larger amount of meat is made under the practice of turnip, rye-grass, tares, clover, and sainfoin growing, than can possibly be done by re-sowing land down to grass. More meat is so made even where intervening crops of corn are taken. If this were not so, how is it that London and many large provincial towns have been almost entirely supplied with meat through February, March, April, May, and June from the eastern counties, 95 per cent. of which are certainly arable? The arable husbandry which has been practised so successfully, so far as producing crops go, for generations, has made just the difference through the above months between our present fat luscious fresh joints and the pickled barons and salt junk of our forefathers, and the dried American beef to which the writer in the *Globe* alludes.

The true cause for farmers thinking of "replacing arable lands by pastures," arises from the way in which peasants have deserted villages during the last quarter of a century to seek employment in towns. It has been said this result is a good thing both for the labourers themselves and the payers of poor-rates. It will be remembered this question was incidentally raised last autumn in the *Mark-Lane Express* when we were considering the education of children, under the heading "The Improved System." No theory can possibly be more erroneous than this. But it has been again said that peasants have got better wages in towns than they could have done as agricultural labourers. Just so. This however is not because these labourers would not have been better paid if agriculture had been treated with fairness during the violent and enormous fiscal changes which have taken place since 1844, but because British farmers have been left out of all consideration, while the commercial laws of the country have been turned upside down, and consequently that capital which should have returned to them legitimately, and with which they would have employed a largely increased amount of labour, has year by year grown proportionately less, till they have been obliged to expend the least possible amount of money in this way. We are referring to the bulk of farmers, and not losing sight of exceptional cases on stock farms, where the tenants or proprietors and farmers had a large balance at their bankers' and their occupations were adapted for breeding stock. This is why the "farmers are considering the expediency of replacing arable lands by pastures." Labourers cannot work on credit. And as corn has come to so little money, except during the Russian war, farmers have been obliged to curtail their autumn and winter expenses, that their money-balance might not be on the wrong side at the next Midsummer rent-day. Labourers have therefore fled from villages, to seek employment in towns or manufactories and mines. The natural result is, that at times and seasons when hoeing would need to be done all at once, or when hay and corn harvests would be ready, the hands at command have been so scarce that double the wages have often been demanded that a farmer according to prices of produce could afford to pay. During the present and past hay-harvest, although the crops have been unusually light, farmers have besieged parliamentary trains at railway stations, to secure the migratory labourers who in the summer turn up by accident or design, with scythes and sickles on their

backs. Under these circumstances laying fields down to grass for three or four years in succession is far less unprofitable than cultivating for roots, green crops, and corn, with all the ramifications which belong to ploughing, horse-keep, hoeing, pulling, cleaning, hauling, and cutting-up for animals in yards and stalls. But although this is less unprofitable, because the expenses of cultivation at the present price of labour far exceeds returns from productions, the loss to the nation in the yield of meat is, under this grass husbandry, in many cases one-half.

It would be advisable for the writers in the *Globe*, and other daily papers, not only to reconsider the arguments they have used of late years, and which have, from the influence they have had on the humbler mind, brought the country to its present alarming position as regards the price of meat, cheese, and butter; but before they sit down to write another special article on the subject, they had better master a few conspicuous facts by their own observations, or else ask some country dame a few questions on the points swimming before them.

As we like to support our views by authorities, that uninformed fine writers may not fall back on the style they know how to use with so much facility, and make it plausible to the mere superficial town-bred reader that these are mere theories spun out of an alarmist's brain, we will quote a passage, as found in *Hansard*, spoken by the late Sir Robert Peel. In 1861, when he was considering the state of agriculture, he said, in reply to predictions that have been, and are being verified to the letter: "I say this, also, sir, that if it be true that the occupying tenants of this country are unwilling to reduce the amount of labour which they employ—if they are making exertions to prevent the distress under which they are suffering *from visiting those on whose labour they depend*—they have on that account an additional claim to our respectful consideration. I do not, indeed, agree (*whilst I admit the distress which prevails*) with the apprehension and dependency of others as to the future condition of the agricultural interest."

The present price of meat is just one of the results which Sir Robert said he did not anticipate. The public have, however, eaten a greater part of their cake, and, according to the contemporary we have quoted, they are taken by surprise, with free-trade in the article in question, at the small allowance left. If further information be wanted it can easily be produced.

W. W. G.

## OPENING DINNER OF THE SALISBURY HOTEL.

On Monday, July 10, the opening dinner of the Salisbury Hotel, Salisbury-square, Fleet-street, took place in the spacious dining hall of the establishment, and it proved in all respects a very satisfactory inauguration, showing clearly that the adaptation and completeness of the new building for the purposes of public festivals are not less remarkable than its merits and capabilities as a private and family hotel. The perfect quietude of Salisbury-square, situated as it is within a few yards of Fleet-street, was strikingly demonstrated on this occasion; and as to the dinner and attendance, they left nothing to be desired. The hotel apartments were at the time full to overflowing, and great satisfaction was expressed by the visitors both at the general construction of the building and at the manner in which the hotel had been fitted for the reception of those who may avail themselves of its accommodation.

The attendance at the dinner amounted to about 120, including about fifty or sixty of the leading members of the Central Farmers' Club, whose home is now at this hotel, and a large number of the shareholders of the Hotel Company. The Hon. E. T. YORKE presided, and Mr. R. Leeds, chairman of the Club acted as Vice-President.

Before dinner, which, as already intimated, was on a liberal and sumptuous scale, and admirably served,

The CHAIRMAN gave the following quotation by way of prayer: "Pray God our cheer may equal my good will and your good welcome here!"

The CHAIRMAN: At all our English gatherings, festive or otherwise, we are accustomed to crown them by toast-giving;

and among the first of English toasts—and may it never be otherwise—we rank the "Health of the ruler of the United Kingdom and our countless dependencies, our most beloved and gracious Queen" (cheers). She is a practical example to the rulers of all free countries and peoples, as a constitutional governor, a model of domestic rule, a compassionate friend, a tender, feeling woman (renewed cheers). Her true dominion is in the hearts, her power is to be sought and found in the love of her subjects (Hear, hear.) She is emphatically the Mother of her people; their safety is her care, their prosperity her delight. May it please the Almighty Giver of all good to take from her the burden which has weighed so heavily upon her (Hear, hear.) May it please Him to restore her to the presence of her longing lieges, and give back to herself that peace of mind to which she has so long been an alien and a stranger (Hear, hear.)

The CHAIRMAN then gave "His Royal Highness the Prince of Wales, the Princess of Wales, and the rest of the Royal Family." He said the Prince of Wales was not simply their expectant ruler—and might God long avert the day of his accession!—but in every sense of the expression an English gentleman. He had identified himself with the national pursuits and pastimes, and he (the Chairman) could answer for it that there were few men who when they entered the hunting-field went straighter, or found their way out better than His Royal Highness (cheers). It was really charming to see him go across country (Hear, hear.) His qualifications as a ruler had yet to be tested: they would not attempt to dive into the future, but would hope that his rule, whenever the time for it

should arrive, would be like his royal mother's, and then would it in all probability be peaceful and happy (cheers.)

In proposing "The Army, Navy, Militia, and Volunteers," coupled with the name of Mr. Dumbrell, the CHAIRMAN said they had had recent proofs that the army was not inferior to that which fought in the Peninsula or at Waterloo. At the Alma, Inkermann, and Balacava the old reputation of the British soldier was fully maintained. As to the navy, although science had made great changes in its outward aspect, and they now owned vessels which were altogether repugnant to the former ideas of sailors, the wonted spirit animated the service, and an enemy would, he believed, still have cause to regret a near approach. The militia continued to be a capital nursery for the army; and as regarded the volunteers, now comprising 150,000 bayonets, he trusted that if the time should come when that force was called into active service, it would exhibit a courage in action equal to the patriotism which it had hitherto displayed (cheers).

Mr. DUMBRELL said he had never risen with greater diffidence than he did at that moment, having to return thanks for the important toast which had been so ably proposed and so cordially received. It was needless for him to say that the army and the navy would always do their duty, as they had hitherto done, whenever they might be called upon to defend their country; and he was convinced that the militia and the volunteers would also do theirs if their active services should ever be required (cheers.) He knew that it would not be right, especially on the eve of a general election, to trench on politics; but he could not help expressing a hope that among the clap-trap cries with which it would be attempted to delude voters, reduction of the estimates for the army and navy would find no place (cheers, and expressions of dissent.) Much as the farmers of England would like to see the expenses of the country diminished, those were, he believed, the very last departments which they would wish to have curtailed (Cries of "No, no;" and "Yes.") The public had much to thank the army and navy for in the past, and it would, in his opinion, be bad taste now, in times of peace and prosperity, to cut down the estimates of those services (Hear, hear).

The CHAIRMAN then rose to propose the toast of the evening, namely, "Success to the Salisbury Hotel." He said: Gentlemen, the toast of the evening deserves, as such, especial notice: it must be introduced by becoming observations, welcomed with a hearty and cordial unanimity, and, as I shall take leave to recommend, with its appropriate libations. What shall these libations be—what their measure? I assume that among so numerous a body as that I see before me, there may be some followers of Pindar and the "Permissive Bill"—men who think water the one thing needful, and who, with Timon of Athens, may designate it *honest*, "since it puts no man in the mire." On the other hand, there must be many (and, if read aright, the effluence incidental to a good circulation is manifest in the countenances of those around me)—I should say very many (a large majority)—who were well-regulated worshippers of the jolly god, and who thought the inspired harper touched the right chord when he said that wine was made "to gladden the heart of man," and, in presence of such well-authenticated acknowledgment, gladdened their hearts accordingly (Hear, hear, and laughter); and thus I trust that wine will carry the day (Hear, hear). Now, gentlemen, as to the measure. I am led to infer, from certain readings, that there was, in ancient and bygone times, some laws, in respect of quantity, which governed post-prandial potations. On one memorable occasion, it is recorded, a certain Eastern king gave to his nobles and neighbouring princes and potentates a great banquet; and it is then stated that "the drinking was according to law—none did compel." Here, then, is the record of a law. There was no intimidation: everyone used his own discretion—none did compel; but they drank to repletion, as the sequel of the history discloses. On the other hand, among the old quaint stories of the sister-kingdom, it is said that, in the exercise of that hospitality for which it was so justly celebrated, another rule prevailed, contrary to that already mentioned, and in itself a paradox. "Gentlemen," said the host, "this is Liberty-hall, but you must drink bumpers" (laughter). On this occasion I give you all the latitude I can. This is Liberty-hall for the moment, but you must drink bumpers (renewed laughter). And now, gentlemen, to the toast itself: "Success to the Salisbury Hotel" (loud cheers). Gentlemen it seems to me that the normal law of Nature is

change; and if the change of old institutions and customs and observances be founded on right principles, is conducive to right public ends, is steadily pursued, and subversive of something unsatisfactory already existing, that change must have beneficial consequences. What a change was that of old, from bondage to the liberty of the Promised Land! It was accompanied by trials, and murmuring, and rebellion. The wanderings were tedious—the struggles continual. They were marked by misrule and mal-administration. Even the manna and the quails were but indifferent substitutes for good hotel accommodation. But the change was made, and greatly to the satisfaction of the Israelitish public (laughter). What a change has been wrought on our brightland of freedom! How much has been passed through, before we arrived at the Palmerstonian age? How many sheets have we added to the document of Rummynede, by which popular liberty was so rudely deceived! Political revolutions, Church reformatations, are indorsed thereon. The stains of loyal blood and of martyrs disfigured them with their unlovely indelible colour. The change was demanded; it was worked out, and civil and religious liberty are now among our choicest blessings (cheers). And now, gentlemen, having mounted my stilts, as I had a right to do, in order to establish a platform for my principle, I descend to the common level of to-day, to show that in this especial matter of hotel accommodation a great change was demanded, and being conceded will be to the advantage of the public. Who is there among us who has not felt the want of it? (Hear, hear). Who is not old enough to remember the interesting communications made to the *Times* on account of the times (laughter). How Paternosters stormed, and Materfamilias raved! With what anathemas were the hotel bills paid; with eggs at 1s. a-piece, and bad wine a guinea a thimble-full! (great laughter). John Bull became frantic. All know how he is represented to us on paper (laughter)—a stout heavy weight of some 15 or 17 or 20 stone, with his white hat, large abdominal proportions, a white waistcoat, rather baggy continuations, and a pair of brown-top boots, filled to the brim with calves that would make an Irish chairman stare (laughter). Such we always knew him to be. But during this dearth of good available accommodation he became a new creature and much to be pitied (great laughter). The fine proportions to which we have alluded, instead of being covered with that adipose stratum so indicative of good living, good appetite, and good digestion, were filled with serum and wind; his garments hung loosely upon him, like a livery servant on board-wages (laughter). His calves diminished as his midlands increased, and in his sad condition he called aloud for change (Hear, hear, and renewed laughter). There was a ready answer to the call. Capital found a new vent for its outlay, and the result has been that a great change has been already wrought in this economic necessity. I need scarcely enumerate them—the Langham, the Grosvenor, the Alexandria, the Grand Terminals of the North Western, the Great Western, the Charing Cross, and some others, and last, and not least in our dear love, "The Salisbury," to which we invite you to do honour, and call down on its success. We do not profess the magnificence of those splendid establishments already spoken of. We take a humbler position, and regard ourselves as devoted to the interests of the middle classes. We offer cleanliness, comfort, and civility, moderate charges, and full measure (cheers). We hope for success: and if we can satisfy the public of our desire to promote their advantage, the public will promote ours (cheers). In Tickell's play of "Cato" we find these words—"It is not in mortals to command success; but we will do more, Sempronius; we'll deserve it." And now, gentlemen, I have to thank you for your kind attention, and without a word more, I call on you to drink enthusiastically, "Success to the Salisbury Hotel" (loud cheers).

The toast was drunk with great cordiality.

Mr. H. TRETHEWY said although he felt very great pleasure in proposing the next toast, yet he rose with great diffidence, after hearing the eloquent and admirable address which had just been delivered by the Chairman (cheers). But the subject of the toast was such as to make up for any inadequacy on his part in proposing it. They had all had an opportunity of judging of the ability of their chairman in presiding over the opening dinner of that hotel. The Directors of the Hotel Company had had frequent opportunities of observing his business qualifications, and he felt confident that every member of the Board would endorse what he said when he declared

that they felt themselves extremely fortunate in having such a gentleman to preside over them (cheers). When that undertaking was first launched, the originators had some difficulty in finding a suitable chairman, and they felt that it would add very much to their chances of success if they could obtain the assistance of a gentleman like the Hon. Mr. Yorke (cheers). Happily that gentleman came forward, and had kindly rendered all the assistance in his power. In the Chairman's presence he ought not, perhaps, to say more; but he had said quite enough to commend the toast to all who were assembled (cheers). He begged now, with feelings of gratification and gratitude, which he was sure must be shared by the members of the Company and of the Club, to propose the Chairman's health (loud cheers).

The toast having been drunk with great cordiality,

The CHAIRMAN said he felt deeply grateful for the kind manner in which his health had been proposed by Mr. Trethewey, and received by the company. It was impossible for him to say much in speaking of himself, and he certainly felt that he did not deserve the eulogiums which had been lavished upon him. When he was asked by friends of his to undertake the task of presiding over the Hotel Company, he recollected that he had been for many years connected with the agricultural body, and had always met with favour and indulgence at their hands, and that he had no means of rendering a return except by placing any poor services which he could render at their disposal. He trusted that one feature at least would characterise his career as chairman, namely an anxiety to do his duty truly and honestly in connection with the trust reposed in him, and that he felt sure was the way to gain the heart of every right-minded man (cheers).

The CHAIRMAN then proposed the health of the Vice-Chairman, Mr. B. Leeds. He hoped, he said, to know more of that club than he did at present. Numbering as it did more than 500 members, it might become a powerful ally and auxiliary of the Hotel Company. The members who came there had only to state their wishes, and whatever was fair and just would be accorded to them (Hear, hear, and cheers). He did not suppose that, with their practical experience, they would, any more than the British public, expect to be fed for nothing (laughter), though it was too much the fashion in the present day to believe those who professed to sell things for nothing, or even to give them away (Hear, hear). He hoped that the Hotel Company and the Club would bear with each other. Any complaints which might be made would be met in a fair spirit by the Company; and while the Directors of the Hotel would do all in their power to meet the wishes of the Club, he trusted the Club would render its assistance in the efforts to make the enterprise now inaugurated successful (cheers). He regretted to say that Mr. Leeds was too unwell to respond to the toast; and it would therefore be acknowledged on his behalf by Mr. Congreve.

After a hearty response to the toast,

Mr. CONGREVE said he was sorry that he had been so unexpectedly called upon to return thanks for the honour paid to the Central Farmers' Club in the person of its chairman, Mr. Leeds, and especially did he regret the cause of that call. He was sure that every member of the Club who came to that hotel would be very much gratified. For a very long time the Club was in a transition state; and during that period they were kicked about from pillar to post, and very often they did not know where to lay their heads. He did hope that the accommodation now provided would be found fully adequate to the wants of the Club, and also that the hotel would receive from the members an adequate amount of support. Many members of the Club were shareholders; but the proportion of shares held in that quarter was not so large as the directors could desire. A few shares still remained unallotted; and if members who were not shareholders already should, in consequence of what they had seen that day, or might see or hear hereafter, desire to embark in the undertaking, the board would feel great pleasure in enrolling their names (Hear, hear). He was happy to see present on that occasion their former host at the York Hotel, Mr. Quartermaine, who in that capacity did so much to promote the comfort of the members (cheers).

Mr. G. P. TUXFORD on rising to propose the toast of "The Directors," said he could not help congratulating those gentlemen on having such an assemblage as that on such an occasion. He did not know any institution which had been more

tion they were that evening convened to celebrate. He well remembered that in days of yore, when they went to see the Smithfield Show, the only accommodation offered to them was in a sort of barn in the neighbourhood; and his friend Mr. Congreve had reminded them that evening, with a plainness of speech for which he felt inclined to pat him on the back, that latterly the members of that Club had been kicked about from pillar to post, and had not always found a pillow on which to lay their heads (laughter). They were now, however, in a very different position; and he was quite sure that if the good feeling and goodfellowship, manifested on that occasion could secure success for the institution, success was already realized (cheers). His toast related especially to the directors of the hotel. He knew a good deal about some of those gentlemen, and could speak practically respecting their merits. Commercially they were a good sample of what directors ought to be, and he concurred with the honourable chairman and other gentlemen who were immediately associated with him in the management, that the Salisbury Hotel was likely to prove a safe and good investment, and that if it did not succeed it would be the fault of the farmers themselves and not of the directors (Hear, hear). He begged the company to let their minds dwell on that last phrase. If farmers would not patronize the Club, then however clever, however able, however honest, however worthy, however elevated the directors might be, there could not be success; and the farmers, as a body, would have themselves to thank for the result. It would, he repeated, be their own fault if the hotel raised for their accommodation did not succeed, and they would have no one else to blame. Let them not lay any flattering unction to their souls if there were no dividend, or say that the cause of that was that people would not frequent the house. They might depend upon it, that just in proportion as they themselves patronized the hotel, and induced their friends to patronize it, would it flourish. In the directors, they had honest men to deal with; and success depended entirely on themselves. Let them, then, show what the farmers of England were capable of doing for an establishment which was created for their own benefit. He should have been very glad if that hotel had been in name simply a Farmer's Hotel or Club, instead of being presented to the public merely as "The Salisbury Hotel." He regretted that the farmers of England had not come forward in much greater numbers to take shares in that undertaking (Hear, hear). The agricultural body constituted at least one-fifth of the entire population, and yet hardly sixty persons belonging to it had become shareholders in that hotel. Perhaps that was not the proper place for reminding farmers of the duty which they owed to their own class; but he could not help saying that, even in a commercial point of view, they had not sufficiently regarded the advantages offered to them. It was, however, never too late to learn; and they had been told by a preceding speaker that there was yet room for increasing the agricultural element among the body of shareholders by means of the shares still unallotted (Hear, hear). He confessed that he should have much preferred the field being wholly occupied by agriculturists; but he hoped that they would now be roused from their state of somnambulism (laughter), and either by applying to the secretary, or by making inquiries on the Stock Exchange, acquire an interest in the concern. He had to couple the toast of "The Directors" with the name of the vice-chairman, Mr. Clayden. They were all well acquainted with that gentleman. He had himself had business transactions with him; and although he suspected that he gave too high a price, Mr. Clayden being rather too much for him (laughter), no doubt he got a good animal for his money (Hear, hear). Well, now, there were energy, and enterprise, and practical skill connected with the management of that institution; and he could not sit down without having expressed his feelings with regard to the board of directors. That was not an institution which resembled, in its concoction or management, many of those new undertakings of which they heard every day in London. The labour of the directors was a labour of love—a labour in which the great object in view was to meet the necessities of those for whom the hotel was designed; and he believed they had in the managers the very men who were required. That establishment afforded facilities for intercourse among farmers, which were of the greatest value. A man might stay at home till he became insensible of the advantages of intercourse with his fellow-men (Hear, hear). Nothing

scarcely improved men so much as travel; and nothing tended more to mutual comfort and advantage than the being enabled to exchange ideas with those who were engaged in the same pursuits. He had, he feared, tried their patience too long ("No, no"); and he would now conclude by proposing health, long life, and prosperity to the directors of that institution, coupling with the toast the name of his old friend Mr. Clayden (cheers).

The toast having been drunk,

Mr. CLAYDEN said he had to thank them for the honour which they had done the directors. There were great difficulties in forming a company for the building of that hotel, but all difficulties were ultimately surmounted. They were most fortunate in obtaining such an excellent site. They had all enjoyed themselves that evening amid perfect quiet as regarded the streets. There had been no rumbling of wheels, no noises outside to disturb them, and that was surely a great advantage in the centre of a crowded city like that. The object of the board had been to provide a comfortable hotel; they had not aimed at splendour, but at comfort and convenience, and they trusted that their efforts would be appreciated, both by the shareholders and by the members of the Central Farmers' Club. The attendance that day was extremely gratifying, showing, as it did, an interest in the establishment on the part of those to whom the directors chiefly looked for success (cheers). He was happy to be able to assure them that there had been perfect unanimity in the board (cheers). There had been no antagonism, but they had gone on working comfortably and harmoniously together, and he trusted that as long as they had the honour to occupy their present position their conduct would be such as to command respect and esteem (cheers).

Mr. GALSWORTHY proposed "The Builders and the Architect"—Mr. Trollope and Mr. Giles. Those gentlemen had, he observed, provided a building which was admirably adapted for the purposes for which it was designed. The Messrs. Trollope had executed their work for a very small sum of money, and without that abominable tax on nearly all building concerns, an immense charge for extras (Hear, hear), and under those circumstances they were assuredly entitled to great praise. Mr. Giles had previously distinguished himself as the architect of another hotel, he meant the Langham; but he (Mr. Galsworthy) would much rather be a shareholder in the Salisbury than in the Langham (Hear, hear). As regarded the management of that hotel, he was particularly struck with the observations of the chairman. If he might be allowed to do so, he would impress on the directors the great importance of civility on the part of the attendants. That was a point on which the success of such an establishment as that very greatly depended. With respect to the shares, he could not help thinking that if those who were inclined to take some did not apply soon they would be unable to get any. It was not to be supposed that after a number of gentlemen had taken the risk of failure, others could come in at any moment to share their success (Hear, hear). The majority of new companies in the present day were complete duffers, by which he meant that the value of their shares depended on the rigging of the market; but, so far as he could judge, there had been nothing of that kind in the case of the Salisbury Hotel Company, and there being but few shares to be allotted, if farmers did not obtain them it would be their own fault (Hear, hear).

Mr. TROLLOPE, in responding, said he had to return thanks for Mr. Giles as well as himself, that gentleman being, he regretted to say, too unwell to attend. He wished it to be understood that the architect had the whole responsibility of the plans; his (Mr. Trollope's) duty was simply to carry them out, and therefore all he could take credit for was the manner in which the work had been executed. In Mr. Giles's absence he would say that, looking at the nature of the ground and at all the surrounding difficulties, it seemed to him an exceedingly well-planned house (Hear, hear, and cheers). The passages were all wide and airy, the rooms were all light, and on one of the most difficult pieces of ground that it was possible to conceive, a well-planned hotel had been erected. The rooms for the visitors were just what were wanted, and in that respect they presented a contrast to those in some other large hotels. In some new hotels they found rooms entirely out of proportion to the amount charged for them; instead of nice, cosy apartments, where any man would delight to sit down and would at once feel himself at home, they found great, lofty rooms highly decorated, in which hardly any one would feel comfortable. In fact, the great mistake with regard to nearly all the new joint-stock hotels was that everything was

overdone. That was not the case with regard to this hotel, with respect to which he again said the only merit which he could himself claim was that of having carried out the instructions of the architect. His firm had done their part of the work honestly and he believed well, and he trusted that the result would prove satisfactory to the shareholders and all concerned (cheers).

Mr. J. WOOD proposed the health of the Secretary, Mr. H. Corbet. He said the shareholders of the hotel company were perhaps not, if the members of the Farmers' Club were, as well acquainted with Mr. Corbet as he himself was. Having been a member of the committee of the club almost from the time of its formation, he could testify to the high character of the Secretary (cheers). He well recollected that the previous secretary and the late Mr. Shaw were very anxious for the establishment of a building like that for the club; but at that period there was no limited liability, and the scheme could not therefore be carried out. As regarded the question of taking shares, he must say that farmers, living as they did in the country, were bound to be cautious, and that the times were not such as enabled them to invest a large amount of capital in projects of that kind, even although they might be certain to yield good profits. Perhaps the fact of Mr. Corbet being connected with the hotel officially would tend to keep up a better feeling towards the Farmers' Club than had been evinced by some members of their body in connection with the question of taking shares in the hotel (laughter). For himself he could only say that, having previously subscribed £50, he had just added £10 more, and he hoped that others would imitate his example (Hear, hear). The Secretary would, he trusted, continue to keep the two institutions—the Club and the Hotel—together, and not be a party to any separation of their interests (Hear, hear). He now called upon them to drink Mr. Corbet's health with a bumper (cheers).

After a warm response to the toast,

Mr. H. CORBET said if any one had told him two years ago that he should ever be the secretary of a hotel company, he should have said in so many words "That's not true," and if at that time he could have heard Mr. Wood's speech he should have said it very emphatically (laughter). Mr. Wood had placed the difficulties of his position so graphically before him, that he never felt them so much as he did at that moment. He trusted, however, that the Agricultural Hotel Company and the Central Farmers' Club would pull well together, and he certainly should not attempt to separate the one from the other (Hear, hear). Indeed, in the position he occupied, it would be impossible for him to do so. He accepted office in the Company in very much the same spirit as the directors. They had been trying to do what they could for the good of the Club. They tried, in the first instance, to place the Farmers' Club in a better position, and they had succeeded in doing so (Hear, hear). They had secured for the members greater convenience and comforts, and he hoped the result would prove profitable to the shareholders. They all knew that there was a class of commercial gentlemen who travelled about the country to obtain orders; and he hoped that all the shareholders in that hotel would regard themselves as a sort of bagmen (laughter and cheers), and in travelling about do all they could to induce their friends, and those with whom they conversed, to come to that establishment when they visited the metropolis (cheers). Having for twenty years occupied the position of secretary of the Farmers' Club, he wished to say a word or two with regard to the accommodation in that establishment. For the last two or three years they had, as had been previously remarked, been pushed about from pillar to post, and, of course, every one had felt it his duty to find fault. He hoped that no one would feel it his duty to do that any longer, and that, if he did not find all the comforts of the Carlton, or the Conservative, he would make some allowance. It took some time to get things into good working order in an establishment like that; but he trusted that before long the management of that hotel would give satisfaction, not only to the world in general, but even to the farmers of England (laughter). He would only say, in conclusion, that he accepted the office of secretary of the Company not from a love of filthy lucre, but simply in order to provide better accommodation for the Club (cheers).

The CHAIRMAN said he hoped all who were present would testify that they had had what was promised—good cheer and everything that could make the heart of man happy and glad at such an entertainment. He would now give "Our next merry meeting." (Cheers.)—The company then separated.

## SCOTCH FARMERS AND THE GAME LAWS.

A meeting of tenant-farmers and others interested in a modification of the game laws was lately held in the Corn Exchange Hall, Edinburgh, Mr. Wm. McCombie, of Tillyfour, presiding. The meeting was very numerously attended, as there must have been about 400 farmers present.

The CHAIRMAN, in introducing the business of the meeting, said: I return you, gentlemen, my most sincere thanks for the honour you have conferred upon me by placing me in the chair. I had lately an opportunity of stating my views respecting the question that has called us together, and my experience as a practical farmer confined to the Vale of Alford, at a meeting of the Chamber of Agriculture. I should regard myself as acting somewhat presumptuously were I, as your Chairman, to make a second speech on the game laws, being aware that many of the parties present are quite able to paint in proper colours the evils produced by the administration of these laws. I would express an earnest hope, that while the gentlemen who take a part in the discussion here to-day maintain firmly their opinions respecting the damage caused by the depredations of birds and four-footed wild animals, they will not use any terms that may be justly regarded by our opponents as discourteous or intemperate. The proceedings of this large meeting of the farmers of Aberdeenshire, marked, as I am confident they will be, by the moderation and the unanimity it becomes us to display, must exercise influence on the country and the legislature.

Mr. COPLAND, Mill of Ardlathen, moved the first resolution, as follows: "That hares and rabbits ought to be excluded from the operation of the game-laws; that their preservation being incompatible with good farming, is contrary to the public good, and that, therefore, all contracts having for their object the preservation of hares and rabbits, ought to be declared illegal." He said: Gentlemen, I cannot help thinking that many of my brother-farmers are so much better qualified to do justice to this important subject. I cannot speak practically on the subject, never having suffered from the effects of game; for I was born, ever have been, and still am, on the Aberdeen property, and I have had permission to kill game on that property ever since I was able to carry a gun; and to the credit of that noble family be it told, neither of the three earls I have been under were ever known as game preservers, but, on the contrary, in a greater or less degree gave permission to their tenants to kill game on their farms, and on no occasion ever allowed the game so to accumulate as to destroy their crops. But I and many of my friends being thus favourably situated, is, in my opinion, no good reason why we should not sympathise with our brother-farmers who have not been so fortunate. Nay, on the other hand, I think we are called on not only to sympathise with them, but also to join them in using every constitutional means in our power to get these laws modified, by which they have suffered so much. This resolution proposes "that hares and rabbits be excluded from the operation of the game-laws;" but although it proposes that they be taken from the game-laws, it by no means proposes that they be extirpated: quite the reverse; for in speaking my own sentiments on this subject, I am quite sure I am also speaking those of the tenantry of Aberdeenshire in general, when I say that we would be extremely sorry to see the day when our proprietors and their friends could not enjoy a good day's sport on our farms; nay, we would, and do take a pride in showing them a good head of game when they do come across; all we wish is, that having hares and rabbits taken from the game list, we may have a legal right to put them down to such an extent as that our crops do not suffer from them. I think the withdrawing hares and rabbits from the game list would also produce a better feeling between proprietor and tenant; for we are all aware that a bad feeling often exists between proprietor and tenant where there is a large stock of game, and I cannot help thinking that this in a great measure arises, I do not say altogether, but in a great measure, from a misrepresentation of facts; or, at least, from having them highly coloured by the gamekeeper, who invariably has the ear of his master. Now, if this resolution were carried, and the tenant had an interest

in the game, he would be found to be the proprietor's best keeper; and the services of the paid one being dispensed with, this much-to-be-deplored feeling at present existing between these parties, and which is so detrimental to the interest of both, would in a great measure be done away with. Gentlemen, the reasons assigned in this resolution for having hares and rabbits excluded from the game list are, "that their preservation being incompatible with good farming, is contrary to the public good." Now, gentlemen, it requires me to say little on the part of the resolution, to a meeting of intelligent farmers such as the present, to show them an over-stock of hares and rabbits is incompatible with good farming; for the practical farmer is aware, and he only is aware, that if disease gets into his stock, what a disheartening thing it is. I am not referring to it in a pecuniary point of view, for we all know the actual loss; but I say how disheartening a thing it is to see his cattle one after another die away; but I tell you, gentlemen, it is not more disheartening than after he has improved his land by drainage, subsoiling, high cultivation, having the seed put in the ground in good condition, and his hopes under Providence of a remunerative crop, to find morning by morning as he passes over his fields, that, instead of benefitting his family and country by making two blades of grass and corn grow instead of one, he has not been able to make the one grow, for day by day as it springs up, night by night it is nipt off by hares and rabbits. I think it is equally apparent that an overstock of hares and rabbits "is contrary to the public good," for it must be allowed by all that the farmers are the manufacturers, in the raw state at least, of beef and bread. Now, instead of being discouraged by having their grass, turnip, and grain crops destroyed, as I have been describing to you by an overstock of hares and rabbits, ought they not rather to be encouraged to produce as much as possible of both these necessities of life, so that their price might be kept within the means of a large and fast increasing population? Let us now, gentlemen, look at it in a moral point of view: but so much has already been said and written on it in this way that I shall merely allude to the case of the poacher. Now, gentlemen, I at once say that with the professed poacher I have no sympathy as a poacher. Let us look at his moral character, and its effect on the community: he may at first be, and often is, an honest industrious man, and a respectable member of society in his own sphere of life; but no sooner does he begin to poach than he throws aside the pick and shovel, as he finds by the quantity of hares and rabbits, that, instead of earning thirty pence at his former employment, he can by taking his gun and nets earn thirty shillings per day; finding poaching thus profitable, he continues until he is convicted; once convicted, he loses all self-respect, and descends in the scale of vice degree by degree, until he ultimately rushes into crime, it may be murder; thus bringing not only his own family, but also that of his victim on the parish. Now, gentlemen, if we could by taking hares and rabbits from the game list, take temptation from the poachers, and instead of having them, what I have been describing them to you, pests in society, have them honest and industrious men, and good members of society, would we not deserve the support of the community in this movement? Gentlemen, this resolution in the last place also states—"and that therefore all contracts having for their object the preservation of hares and rabbits ought to be declared illegal." Gentlemen, I cannot help thinking that this part of the resolution resembles what is said to be the character of the P.S. of a lady's letter, viz., that it contains the whole gist of the matter. Some may think it rather strong, and thus ask how are you to carry it? To the first I answer it may be strong, but it is expedient and necessary; for in my opinion if it is declared illegal to enter into any private contract for the preservation of hares and rabbits, the taking them from the game list to-morrow would be of very little consequence indeed. To the second, I say we are to carry it by being united amongst ourselves, by moderation in discussing it at public meetings, such as the present, and by showing that we are asking only what we are in justice

entitled to; thus, and thus only, will we carry the public along with us, and we know that no measure can in the present be carried without bringing public opinion to bear upon it. I say if we thus act with moderation, with unity, and firmness, we will not only ultimately succeed, but we will also obtain that influence for the tenant farmers, which as a body they have never before possessed, but which their position and capital embarked both entitle them to.

Mr. J. W. BARCLAY, Auchlossan, seconded. After some introductory remarks, he said: I affirm, and this meeting will bear me out, that the game laws contribute more than any other cause to breed ill-will and disagreement between landlord and tenant. But for this state of matters, I do not blame the landowner so much as the laws which expose the landlord to great temptation. To one tenant he lets the land, to farm, to sow, and to reap the crops, which, as the fruit of his industry and the means of his livelihood, are to belong to him; and yet the law authorises and supports the landlord in leasing the same land to a second tenant to rear animals to feed on the crops which really and truly belong to the first tenant, which belong to him as really and truly as any property can belong to any man. Can such laws be just, or can there be more flagrant invasion of the rights of property, of which we heard so much in connection with these laws? Many landlords, honour to them, resist this temptation, and allow him to kill the game to whom they really belong—the man who feeds and maintains them; but the great majority cannot resist the temptation of an additional rent, which they may think comes from land, but which is in reality wrung from the tenant. As the commercial classes of the nation increase in wealth, the temptation of high shooting-rents increases, it is hard to say where game preserving may stop. Already, in the higher districts of this county, the red deer have dispossessed the sheep, and Highland cattle are steadily creeping down towards the lowlands, and encroaching on cultivated lands. When is this to stop? With such proceedings going on under his eyes, the most patient and submissive of tenants is forced to ask the question, which is in reality the ultimate question at issue—Are the owners of cultivated lands entitled to convert them into hunting grounds? There are several phases of game preserving—the first is where the landlord reserves the game for the fair sport of himself and friends, and this, I believe, is what was originally contemplated by the game laws. Were their operation confined to this few, nobody indeed would object. Such visits give opportunities to the landlord for observation and friendly intercourse with the tenant, which cannot fail to be highly beneficial to both. It is not against this phase of game preserving we have met to remonstrate to-day. We do not wish game exterminated: we wish only that they shall not be preserved to excess, and this can only be attained by the modification of the law we propose in the resolution now before the meeting. The second phase is where the landlord lets the shootings to a tenant who is almost invariably a stranger. When the landlord lets the game, he oversteps the fair limit, and places himself in a false position. The land which he has already let, he lets a second time to another tenant, who, under the shelter of the game laws, can by means of game eat up and destroy the crops which belong to the first tenant, and the source of his livelihood. The game lives on the farmer—on the crops which belong to him, and the sportsman comes and claims the game as his. Be the laws what they may, it cannot be denied that the landlord when he lets the shootings, on cultivated lands, is reaping where he never sowed. There is still another phase of game preserving, happily unknown, I believe, in this county. I allude to the case where the landlord preserves the game to excess, and feeds them on his tenant's crops for the purpose of making a profit by selling them to the game-dealer. Gentlemen, I do not care to characterise this mode of game preserving: its injustice is only equalled by its meanness. The resolution before the meeting affirms that game-preserving is incompatible with good farming, and therefore contrary to the public good, and against the general welfare of the community. Of this there can be no doubt; for no farmer will go in for high farming, or apply his best energies in raising a first-rate crop, when he knows that a large portion will be destroyed by game. A farmer has the same pride and satisfaction in raising superior crops which an artisan has in turning out a first-class piece of workmanship; and no damages, however fairly assessed, will compensate for the loss of this stimulus, which is altogether apart from profit, and which has done more, I venture to say,

in developing agriculture and improving our breeds of cattle, than the expectation of mere profit. Game-preserving is therefore directly hostile to the development of agricultural interests, and hence to the welfare of the whole community. It is, therefore, for the general good of the nation that these laws should be so modified that they do not come in conflict with the good cultivation of the soil; and this object we hope to attain by the last clause of the resolution, which declares that all contracts for the preservation of hares and rabbits 'twixt landlord and tenant should be declared illegal. I see it frequently asked by commercial people, Why do farmers agree to such contracts? Well, the answer is very easy. The farmer, if he is to continue a farmer, must either accept the conditions imposed by the landlord, or leave the country. The ownership of land is virtually in this country a monopoly. It is not amenable to the free-trade law, which affirms that a demand will always create a supply; for however great the demand may be, however high the price of land may rise, we can only infinitesimally increase the area of Great Britain. This I may call the natural cause which reduces farmer's profits so far below those of the mercantile classes: there are artificial causes aggravating this natural one, and the principal is the law of hypothec, which encourages fictitious competitions for farms—that is competitions for farms by men whose capital is wholly inadequate, to which there is no parallel in the mercantile community. I am one of those who believe that every man is entitled by his birthright to a fair chance of making an honest livelihood in his native country, so far as natural causes will permit, and that the country which sacrifices the interest of the many to the pleasure or advantage of the few is on the highway to national ruin. I do not say that such is the case generally in this country: far from it; but I do say that those pernicious game-laws do sacrifice the interest of the many to the pleasure and advantage of the few. Now, gentlemen, the question arises—that most important question, How are we to have this resolution carried into effect? I answer, simply by sending to the House of Commons men who really and truly represent our interests and wishes. We have the matter to a great extent in our own hands. How can we expect the game laws to be otherwise, when for generations farmers have been sending to Parliament, as the representative of their wishes and interests, men who were repledged by their private interest, and by the prophecies of caste, to maintain and extend the operation of those obnoxious laws? Mr. Barclay then referred to the stand the farmers had taken in regard to the Road Bill, and the success that had attended it; and concluded by eloquently impressing upon farmers the necessity of combining and agitating for a modification of the game laws; and they could not but succeed. The agitation (he said) now begun may be long in carrying its object; but if the farmers are only true to themselves, they must succeed; their cause is just, and if justly and truly supported cannot fail. Our word must therefore be "unity," and let this most influential county set an example to the rest of Scotland. Each must sacrifice somewhat of his private feelings to the general good: no cause, however noble, succeeded without such self-sacrifice on the part of its supporters. If we are only in earnest and trust to each other our object will be gained sooner or later, and the firmer we stand to our resolution the sooner will this longed-for result be attained.

The resolution was put to the meeting from the chair, and carried by acclamation.

Mr. WEBSTER, Newlands, Fintray, proposed the next resolution as follows: "That Justices of the Peace ought to have no jurisdiction in game-law cases." After some introductory observations as to the origin of the game-laws, Mr. W. proceeded: No doubt landlords profess that the reservation of the game is part of the rent, but this is not so easily understood when closely examined. They let the ground, but reserve no claim on the produce, and, consequently, can have no claim, because they take an equivalent in money for the use of the ground. And to institute a claim to the wild animals, under such circumstances, is simply to set forth a claim without a justifying reason, and at the same time to form a conglomeration of interests without a possibility either of ascertaining or maintaining the line of justice between the landlords' and the tenants' interest in the soil. Mr. W. referred to the earlier Acts of Parliament, and to those more recently enacted; but maintained that no law could be effectual or permanent when based on an immoral principle. And will anyone venture to



assert that the laws are based on a moral principle, that permits, nay more, protects a landlord—first to let his ground for agricultural purposes, and then to convert it into a game-preserve at his own pleasure and for his own profit, or let it to another for that purpose? This, I am sorry to say, is too often done, although I have happily not experienced the extreme effects that arise from this system of letting and re-letting of ground so as to secure two rents each season for one piece of ground, yet I have witnessed it. It is of no uncommon occurrence in Aberdeenshire to find a large district of country all leased to agricultural tenants, with the exception of a few patches of plantation, and the whole let, or what is called "the shooting," set in tack along with the mansion or some ancient seat. In one case which came under my notice, the lease extended to five years. The lessee on entry stationed watchers on every country range or hill-side to see that the tenantry, &c., did not disturb the wild animals whilst feeding on their crops. If any person dared to injure any of those animals called game, then the thunders of a national code of laws were immediately invoked, and executed against that individual. The other part of the watchers' duty was to destroy such animals as might be expected to interfere with the game. In the execution of this part of their duty they trapped cats and poisoned dogs belonging to tenantry close to their own homesteads; and as the game multiplied by the hundred and thrived beautifully in the fields, and rats and mice also increased and were unmolested about the house, the feeling of an overtaxed tenantry rose almost to the revolutionary point. By this time the first three years of the lease had passed away. The watchers were then dismissed or converted into trappers to catch the formerly wild animals; and for a considerable time an expert trapper could have easily, and actually did box hares and rabbits, every night he practised, to the value of 20s., for a considerable length of time, which was forwarded to the London market. The whole or nearly the whole money value thus obtained was, in the first place, a sum wrested from the tenantry; but the sum, although handed to the tenants, would not have been equivalent to their loss, because amongst turnips, for example, the wild animals seldom eat more and often less than the half of a turnip, and the remainder is lost. Mr. Webster went on strongly to condemn the practice of introducing clauses into leases binding the tenants, their heirs, and successors, to protect hares and rabbits, notwithstanding any Act of Parliament to the contrary, giving examples of instances of this sort existing in Aberdeenshire. The introduction of the game laws, it appeared to him, could only have been justified had the produce which the game had consumed belonged exclusively to the landlords, and they had paid tenants for their services. But when neither the ground, the labour, the manure, nor seed belonged to them, their plea for protection is swept away. Mr. W. then read the resolution as above, and proceeded: A change such as that indicated in the resolution is necessary to secure that peace and harmony among the cultivators of the soil, which is essential to the public interest and the upbuilding of a united community. After considering the game laws, I am astonished that the proprietors of the soil have not, in a body and with one voice, demanded to be released from sitting in judgment in game cases. There could not be a more invidious position than a proprietor adjudging a tenant to pay a penalty for slaying a hare that had fed on the tenant's crops. The severities of the game laws render it imperative that the judges be disinterested. If a tenant had his stack-yard and the whole produce of the season consumed by fire by the hand, and to feed the revenge of some vindictive miscreant, the individual who kindled the fire, if suspected, would be confined, by virtue of the powers contained in the law for the protection of property. But, nevertheless, the law would presume the culprit innocent until proved by competent witnesses to be guilty. But if a bush of whins or a patch of heather were burned on that same farmer's possession, by that same worthless individual, the game laws would hold the occupier or tenant of the farm guilty of the mischief unless he proved by what means the fire took place or who kindled it. The number of witnesses, and the sort of evidence often accepted as sufficient to prove one guilty of interfering with the game, has also something to do with the dissatisfaction that prevails against the decisions given by the justices of peace in this matter, when we consider that one witness is sufficient to condemn an individual as guilty of a violation of the game law, and that that witness may have trapped the

hare, and then seize the individual whom he knew would pass that way, and who thoughtlessly touched or took up the lifeless hare; and when we add to this the fact that the watcher's master, or some neighbouring justice of the peace, and having an interest in the preservation of wild animals, but ignorant of how both the hare and the man were trapped, and determined to put down poaching, imposed the full penalty of the law on the thoughtless violator of the law. Cases of a similar nature have often occurred, and forcibly demonstrate that both for the maintaining of the laws inviolate as long as they are permitted to exist, and the satisfaction of the public as regards the distribution of justice, game cases ought to be tried before the sheriffs. I trust, therefore, that the resolution which I have moved will be seconded, and unanimously agreed to.

Mr. COCHRAN, Little Haddo, seconded. In the outset, Mr. Cochran expressed his dislike to poachers, and read an extract from a pamphlet on the game laws by Sheriff Barclay of Perth, illustrating the evil effect of poaching on the morals of the labouring population. He also read another extract from the same pamphlet in which the writer commented strongly upon the absurdity of game owners, game tenants, and sportsmen being judges in the case of game laws. Mr. Cochran then went on—Surely after what has been written by such an authority as Dr. Barclay, Sheriff of Perthshire, it is time that such powers be taken from the Justices of Peace, and that all cases be tried by the sheriff of the county on the testimony of not less than two witnesses. Were the first resolution to become law, there would be less inducement for poaching, as tenant-farmers would have an interest in keeping under the four-footed animals; and I am sure there is not a tenant-farmer within these walls but would be delighted to see his proprietor or his friends enjoying a fair day's sport over his farm. At the same time, I think it is degrading to a farmer to pay for a commodity, and to be watched by another party that he does not molest these animals that are destroying his crops. When the game is let to a second party, he endeavours to have as large a head of game as the ground can possibly keep, and the ravages done by game on some estates where the game is let is most awful. I think the time has now fully arrived when tenant-farmers must assume an independent position with regard to the game laws. Hitherto, the want of combination, due in great part to the fear of offending the landlords, has been the means of preventing farmers giving expression to their grievances on this question. Now that the Chamber of Agriculture in Edinburgh and others have taken up and discussed this subject, I trust the tenant-farmers in this county will throw off this timidity and dread of giving offence, and combine together, and not rest satisfied until they get the game laws abolished, or at least greatly modified. I also think that now is the time for discussing this subject—the time for county constituents to agitate this question, and only vote for such candidates as will support a measure to abolish or greatly modify the present game laws. I need not, I trust, tell you, gentlemen, that by combining together, the tenant-farmers can return to parliament any candidate they wish; and I hope the farmers of Aberdeenshire will show to the world that they are determined to send a representative to parliament who will support measures to have their grievances redressed, and rest assured the city constituents will support you by bringing the game laws before their candidates. It says little for our watchfulness to our own interest that we have allowed act after act to be passed in parliament with regard to the game laws, without even lifting up our voices against these obnoxious laws; instance the act of 1862, an act whereby any constable belonging to the constabulary force can stop you on the highway and search your conveyances for game. Such acts would never have been tolerated by mercantile men, and how should we allow such liberties to be taken? I need not tell you that excessive game-preserving stands in the way to success in your business. I am glad to say on the Udry estates, where I farm, I am not much annoyed with game. Still, I have always been of opinion that the game laws in a cultivated district are obnoxious and oppressive. Such laws ought not to exist. There have been several select committees appointed by parliament to inquire into the workings of the game laws, but nothing has ever resulted therefrom. I can have no objections to proprietors preserving game on hills, moors, and all uncultivated lands; but I cannot see how four-footed animals called game should be preserved in a cultivated district.



The CHAIRMAN then put the resolution to the meeting, and, like the former, it was very cordially adopted.

Mr. CAMPBELL, of Blairton, then moved "That the following gentlemen, with power to add to their number, be appointed a committee, for the purpose of taking such steps as to them may seem advisable for carrying into effect the wishes of this meeting, as expressed in the preceding resolution:—Messrs. Wm. McCombie, Tillyfour; Robt. Copland, Ardlethen; James W. Barclay, Auchlossan; Alexr. Mitchell, Ythan Lodge; Gilbert Mitchell, Haddo; James Cochrane, Little Haddo; Wm. Marr, Uppermill; Al. Campbell, Blairton; Sylvester Campbell, Kinnellar; Wm. McCombie, Cairnballoch; G. Webster, Newlands; James Burr, Knapperna; Wm. Walker, Tillymaud; John Bruce, Lightnot;—Philip, Gownar; H. L. L. Morrison, Blair; Wm. Walker, Ardhuncart; Harry Shaw, Bogferra; John Smith, Campfield; G. Skinner, Lealie; J. Reid, Grey; stone, Alford; Wm. Benton, Crookmore; Wm. Walker, Bythnie." In supporting this motion, Mr. Campbell said—We are met here as tenant-farmers, not only for the purpose of protecting our own interests, but also the interests of the community at large, against that bann of all freedom, class legislation; for undoubtedly our game laws are a class law. Under our present system, a farmer's capital is almost smothered in the swaddling clothes of old feudal customs and usages, so that it is no wonder, although agriculture should be poor and comparatively unremunerative. We often hear of landlords complaining that they cannot get tenants of sufficient capital, so as to give full development to the soil. Now, it is well known that capital is abundant, and always speedily drawn into channels where its course is free and unobstructed, and naturally directed from those encumbered by such restrictions as agriculture is under our present system. I hold that every law or custom that tends to obstruct the producing of food for man from the soil ought to be abolished. In connection with game, the question presents itself—Is our legislature warranted in providing sport for our aristocracy at the expense of food for the million? I have no doubt but landlords would always find a legitimate amount of sport on their estates, without legislative enactment. I think it would be a bright day for agriculture if landlords would trust more to the energy, enterprise, and good faith of their tenantry, and less to the arm of the law, to coerce them. To a right-minded proprietor, I think the sport would be sweetened with the conviction that he was courting through his tenants' crops with his tenants' best wishes, rather than doing so by strength of law. It is certainly not a little surprising that such absurd laws should exist in a nation having a representative government. As tenant-farmers, we have had the franchise in our hands for upwards of thirty years; but I am ashamed to confess that our political movements hitherto have too often been a blind following of our landlords, and a supporting of them in their class legislation. I ask, is there any other class of the community that would allow such laws to oppress them as do the agricultural body at present? Undoubtedly not. I think if anything would arouse us from our lethargy, the Game Act of 1862 might be sufficient to do so. I have no doubt, however, but this meeting *sounds the key-note of our majority*, and that henceforth we will think and act for ourselves, without troubling our landlords or their factors for their advice. When landlords almost in every district are forming associations for the protection of game, I think it is high time the tenant-farmers were alive to their position, and also forming associations for the protection of their crops, which are real property, whereas game is not property. The attitude assumed by landlords and their factors before the Hypothec Commissioners is enough to convince tenant-farmers that they will have to fight for their privilege either in game or any other question. The bugbear they there attempted to raise about fore-rents and credit to the tenants shows us the shifts they would resort to, to protect their class advantages. Any practical man knows that fore-rents are just the tenant as it were discounting the landlord's bill: the rent is not there to either of them until it grows, and I do not require to tell this meeting which of the two has the most expense upon it before it is procured. Money, I think, is not so abundant amongst tenants as to be available for advances to landlords, except at a high per-centage. The game and hypothec laws are both remnants of barbarous times, when the landlords were the only capitalists, and when rents were all paid in kind; but now that the wealth, intelligence, and influence of the farming interest have increased so much, the abo-

lition of these laws can only be a question of time; but is it not a little astonishing to find that landlords have so little confidence in their tenantry, as indicated by them and their factors before the Hypothec Commission? Another subject that I would draw the attention of this meeting to, is the large royalties of crows that are being preserved by sundry gentlemen in this county, and that destroy so much the crops of the neighbourhood in which these gentlemen reside. You talk of the rights of property: is it not an abuse of these rights for any gentleman, merely to gratify a private whim, to be at liberty to nurse a pest that destroys the crops of his neighbourhood? I ask, is that not a subject for legislative interference? I would be as jealous of the rights of property as any man; but "property has its duties as well as its rights," and before we get our legislators, composed as they are mostly of landed proprietors, to look our agricultural grievances fully in the face, depend upon it the tenant-farmers of this country will require to make them feel that they have become real game, and claim to be no longer classed on the vermin list. I am aware that we cannot all at once expect to clear our class of that selfish, low, mean-spirited vermin (for I could not call them men) that would, at the beck of their landlord, trample their consciences under their feet. Gentlemen, agriculture is, in my opinion, the most important of all trades, and in order that it should benefit society at large it ought to be conducted on the most intelligent system of commercial equity; but, in place of being so managed, our present leases are so trammelled with unjust and one-sided clauses, that any one reading them would scarcely believe we were living in an age of free-trade, or in the nineteenth century; and it is only by tenant-farmers combining together and making their grievances be felt on their respective members of Parliament, that we have any chance of getting redress, for I have no hesitation in asserting that without legislative interference we are entirely helpless, but I hold we are entitled to demand that interference. Land ought not to be held for political ends, but for producing food for the million; and the community at large ought to join with the tenant-farmers in demanding the abolition of these obnoxious laws that so much retard the producing of food. Parliament interferes with commerce, shipping, and manufacturing, even to the extent of fixing the hours of labour people should work, &c.: why not as well interfere and prevent the abuse of landed property? The time was when the capital used in farming almost exclusively belonged to the proprietor, hence the origin of our present system; but now that the capital required by a tenant-farmer amounts to about one-third of the value of the farm itself, we are entitled to demand an entirely different system. If tenant-farmers could only get the protection of Parliament to a tithe of the extent they give the game, we should consider ourselves fortunate. Is it not astonishing that we should have such a number of Acts of Parliament for the protection of game, and not one single act for protecting the cultivator of the soil? In this changeable climate the farmer has enough to contend with, by his crops being exposed in all weathers, with having an artificial grievance like the game-laws to contend against. Is it not unreasonable that a man could not take a wild beast destroying his property? He may take a thief, but he durst not take a wild beast. How comes it to pass, while other laws are always remodelling to suit the times, that the game and those affecting agriculture are being rendered stricter and stricter? Are not the laws affecting land quite at variance with the other laws of this liberal and enlightened nation? The game-laws are a disgrace to the farmers and their representatives in Parliament. I think it will be a strange account members can give to their farmer-supporters of the way they have managed the game-laws in the past session, but it is disgusting to hear men always complaining about the loss they sustain by game, and yet taking no steps to relieve themselves. Now is the time, when we are about to have another election, for farmers combining and resolving that not a single member be returned for the counties who is not pledged to vote, if not for the abolition of the game laws, at least such a restriction thereof as would render them not hurtful to crops. A good deal has been said about damages, and tenants' claims for the same; but I hold that, in the interest of the community at large, the crops of this country ought to be protected from damage. In my mind, the question assumes a far broader aspect than merely the interests of landlord and tenant. The decision of the House of Lords, on

the 13th, finally settles the point that a proprietor has the right to all wild animals, whether game or not, killed on his lands, and that he has the power to follow and seize them in the hands of third parties. Such a decision is only another exemplification of the extent they will carry the rights of landed property to. If I understand the Lord Chancellor's decision aright, he converts a wild animal, the moment it is killed, into real property, belonging to the landlord on whose property it falls; so, after this decision, should any tenant farmer venture to carry him a rabbit he may have killed amongst his crops he is liable to be seized as a thief for so doing. I mistake very much the spirit that is now abroad amongst tenant-farmers if these laws are allowed to disgrace our country much longer.

Captain MITCHELL seconded.

Mr. McCOMBLE, Cairnballoch, said: You have now passed some very important resolutions unanimously. It is sometimes said that this is only a landlord's and tenant's question; but you have affirmed—and I think most properly and most truly affirmed—that it is a public question, that the preserving of game is contrary to the public good, and contrary to good farming. The latter involves the former, though how much the public good depends upon good farming you do not need that I should explain to you; but there is one view (though, after what has been said, it is not necessary for you, Mr. Chairman, nor for this intelligent meeting of farmers, to have that view prominently brought before you)—but there are many parties in the country, I think, that need to be a little enlightened on how far this excessive game-preserving is inimical or hostile to the public good. In the first place, it limits the produce of the country, and requires us to have recourse to foreign countries to a much greater extent than we might; for I held that no one is capable of estimating the damage done by wild animals to our crops. It is all fudge to say that at harvest the damages can be estimated. Who shall say how much has been prevented in our corn crops from ever being a plant at all? From the very first time that it springs out of the earth these ravages begin. You may know what has been done after the crop has nearly arrived at maturity, but you cannot know what the crop would have been if it had not been for these animals. But think for a moment what a different state of things obtains in the county since the majority of this meeting can recollect—what a change has there been? I can recollect very well, since there were no cattle fattened in Aberdeenshire. Why and wherefore have we been able to fatten cattle? Has it been by the expenditure of the landlord's capital that the change has been wrought? [A voice: "No."] or of the tenant-farmer's capital? [A voice: "Yes."] I say (and I shall be borne out by you—by everyone who has farmed light land in Aberdeenshire) that, but for those extraneous manures, the capital of the farmer, and not the capital of the landlord, has brought into the country, I say (and it should be known abroad over the length and breadth of the country that it is so) that great part of the land of Aberdeenshire would by this time have been yielding to the landlords no rent at all. It is thirty years since (if you will excuse me for referring to an incident in my own experience) that, in manuring the land, one drill of turnips had been accidentally omitted in the service of bones; and the produce of that drill turned out—to use a colloquialism that expresses the meaning better than any English term—were *quasherts*. They were not worth the pulling; and that would have been all the turnip crop that would have been producible upon all the light lands of Aberdeenshire for the last twenty or thirty years but for the introduction of guano, bone-dust, and other manures, which you have been applying to the soil. And is it to be endured, I say, by such an intelligent and enterprising class of men as the farmers of this great county (and I may say the farmers of Scotland) that such ravages should go on, and that we should be rather tolerated to cultivate the soil than encouraged as we ought to be, and protected as we ought to be? Looking at the question as one of public interest, Mr. Caird, in his place in Parliament, has set forth, the other day, that an addition of 1d. per lb. to the price of meat costs the metropolis one million and a quarter sterling a year. And who shall estimate how much, by its diminished quantity, game-preserving contributes to enhance the price of meat, and thus bear against the interest of every consumer of corn and meat within the country? You have done many things in this country. You have begun well, as

some of our friends have said this forenoon: you have begun well in the process of emancipating the tenantry. This is the age of emancipation, the emancipation of trade, the emancipation of the blacks—a great work, which, I am happy to think, has been completed over the water. There is an emancipation which lies in your own hands which yet remains to be effected, and which you have most auspiciously begun (an emancipation not less important than any of those that I have described), the emancipation of the occupier, the emancipation of the tenant-farmers from that craven spirit of subserviency which has too long characterised the majority of us, but which I feel, from the tone and spirit of this and similar meetings, will not characterise the tenant-farmers of Scotland very much longer, and, I say, ought not to characterise such a body as the tenant-farmers very much longer. The matter is in your own hands; and if (as you have been counselled to-day) you are only true to yourselves and one another, you can send such representatives to Parliament as will make your case be heard, and your grievances felt. And I beg to say, sir, that now when there is a national movement—when the Chamber of Agriculture has taken up the question, and has dealt with it in a spirit of equal moderation and firmness—I say that now, if any man will not unite in this movement, if any tenant-farmer is too much afraid of his landlord, or afraid of the petty consequences that may accrue to him in future years—I say that he is unworthy of the character of a free born-Briton, and of the requirements of the time and generation in which it is his privilege to live. I feel as much respect for a good landlord as any man can, and although I have my own views of the matter of property in the land, I do not bring them into prominence here, but reserve that for the fitting time and occasion; but I say this, that there is no man who has so much good in his power as a good landlord—no man who can command so much respect, so much homage, and I will add so much affection as a good landlord, or can do so much good in the district where his lot is cast. But a landlord who does no good is a great incumbrance—a landlord who draws an immense revenue—and who, I have shown, is in the capacity of being able to draw an immense revenue from his lands, solely or mainly from your industry, enterprise, and capital, and who spends that revenue in other countries, or in folly, or partly in maintaining a horde of keepers, who are protectors, not of the produce of the soil, but of the destroyers of your capital—is a great encumbrance. And as that man, in fact, has it in his power, as no man in the community has it in his power, to do so much good, so no man in the community has it in his power to do so much evil, as a useless, and above all a rapacious, game-preserving, and tenant-grinding landlord. I hope that you will go on, and go on together, in this united movement—that you will make yourselves to be heard in the High Court of Parliament—that you will see to it that you send men there who will represent your interests, feelings, and just wishes in regard to this and other questions, in which not only your interests but the interests of the whole community are concerned. The position of the tenantry just now reminds me of what is familiar to the observation of all those who breed poultry—which, I suppose, most of us do—that when it is about time for the young brood to start for themselves, the mother, who has been exceedingly affectionate and attentive before, gets into a temper so much the opposite, that instead of calling her brood around her and caressing and protecting them from the hawks and other devourers, she comes in turn herself to attack them, and gives them some very rude digs with her bill to send them away to do and shift for themselves. Now, I think that it is perhaps a wholesome discipline, if you have been treated by the game-preserving class of landlords in a similar way—to send you adrift to shift for yourselves; and I do trust that you will not fail to profit by it.

Mr. WALKER, Bythnie, said he was happy to meet so many of his brother agriculturists on the present occasion, and to see the unanimous response given throughout the country in favour of a modification of the game laws. Mr. Walker at some length, and with considerable ability, argued against the resolutions adopted by the Chamber of Agriculture in Edinburgh; and suggested that an assessment of one-third of the agricultural value of land be levied on all lands let for agricultural purposes where a reservation is made by the landlord to the tenant either directly or indirectly to preserve and protect game on said lands, and that such assessment should be levied

by the assessor of taxes for the county, the assessment to go to the public revenue. This, he thought, would be a check on the landlord letting his land to two different parties for opposite purposes; and at the same time leave it optional to choose a sporting or an agricultural tenant. Mr. Walker suggested, in conclusion, that, where damages to the value of 2s. per acre over a farm was caused by game, the landlord should be held liable for the whole estimated damage on the farm, ascertained by a licensed valuator, or two practical farmers, and that the tenant should be entitled to deduction of the whole amount from the first rent payable after the assessment of damages were ascertained.

Mr. BRUCE, Lightnot: I beg to move that a copy of these resolutions be sent to the Member of Parliament for the county, and that he be requested to send us an answer.

Mr. SHAW seconded the motion.

The CHAIRMAN: The Committee will have it in their power to deal with this, and will see that something of the kind is done, so that I do not think it is necessary to press the motion.

Mr. CAMPBELL, Blairton: I cannot consent to the withdrawing of that motion. The same force will not go with the resolutions from the Committee as from this meeting. The resolutions should be sent, as proposed, to Mr. Leslie, and his mind ascertained shortly. The election will soon be on, and we ought at once to take the bull, as it were, by the horns, and see what we can do with him.

Mr. BRUCE did not press his motion, and ultimately Mr. Campbell consented to the resolutions being sent to the Member of Parliament from the Committee.

A vote of thanks to the chairman and the various speakers concluded the proceedings.

#### MEETING AT PERTH.

A public meeting of persons desirous of a modification of the existing Game-laws, so as to remedy the grievances complained of by tenant-farmers and others, arising from the great loss and damage which they and the public sustain through the destruction of the crops by game, was also held in the

Royal George Hotel, Perth, on Friday, June 30. There was a large attendance of tenant-farmers, with a sprinkling of landed proprietors. Among the latter were Mr. George Richmond, of Balhaldie; Mr. Patrick Matthew, of Newmill; Mr. Martin, of Newhouse; and Mr. W. S. Turnbull, of Huntingtower.

Mr. RICHMOND, of Balhaldie, was called to the chair, and explained the objects of the meeting.

Mr. JOHN DEWAR, Dean of Guild, Perth, proposed the first resolution, which was as follows: "That the tenant-farmers of Perthshire have suffered great loss and damage from the destruction of their crops by game, and it is the opinion of this meeting that for the remedy of this grievance the existing Game-laws should be modified."

Mr. MATTHEW, Colon, seconded the adoption of the resolution, which was agreed to.

Mr. MARTIN, of Newhouse, proposed the second resolution, which was as follows: "That in the opinion of this meeting owners and occupiers of land ought to be entitled to kill, or cause to be killed, on the lands owned or occupied by them, hares and rabbits, and for this and all other purposes hares and rabbits should cease to be considered game."

Mr. HENDERSON, Collace, seconded the resolution, which was agreed to.

Mr. WEDDERSPOON, Balthayock, then moved: "That every tenant of land should be entitled to have damages awarded to him for any loss which he may sustain in consequence of the proprietor permitting an increase of game on the lands occupied by the tenant during the currency of his lease, and such loss should be ascertained and determined by the Sheriff of the county."

Mr. RUTHERFORD, Muirhall, seconded the resolution, which was agreed to.

Mr. ROBERTSON, Friarton, moved that petitions founded on the foregoing resolutions should be prepared and forwarded to both Houses of Parliament, which, having been seconded, was also agreed to.

On the motion of the CHAIRMAN, a deputation was appointed to wait upon Mr. Stirling of Keir, M.P. for the county, to ascertain his views on the subject of the Game-laws. A vote of thanks to the chairman closed the proceedings.

## ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

### THE VISIT TO PLYMOUTH.

Plymouth is at the base of a tongue of land jutting far out into the English Channel, and is on the water edge of that base. The spirit, energy, habits, reputation, courage, wealth of the community is drawn from the wave that breaks in salt spray against the quays and fortifications of the town. Plymouth sprung into notoriety as a fishing village; was early mentioned as such in certain early Acts of Parliament; rose to the dignity of a seaport town, and finally acquired the rank of a naval station. Its warlike character appears to have been assumed in consequence of the attack of the French in 1399. A cargo of hostile Gauls are reported to have effected a landing on the lower portion of the town (then called Sutton); but the citizens having armed, and the neighbouring gentry, with their vassals, having ranged themselves beneath the banners of Hugh Courtenay, Earl of Devon, the invaders received a sound thrashing, lost 500 men, and were forced to retire to their ships in the greatest disorder. There is no record of the fact, but we dare say the historians and bards of that day compared the event with another of earlier date, also associated with this place, which we find chronicled by Geoffrey of Monmouth. Two giants—kindred to many by whom Goemagot and Coroneus, wrestled for victory upon the heights overlooking The Sound. They held each other

in their huge arms, and panted aloud for breath. Presently Goemagot administered such a Cornish hug to his rival, breaking three of his ribs, that Coroneus, "being greatly enraged, raised up his whole strength, and, snatching him upon his shoulders, ran with him as fast as his great weight would permit unto the next shore, and then getting upon the top of a high cliff, he precipitated the savage monster into the sea, where, falling upon the ridges of craggy rocks, he was torn to pieces, and stained with his blood the waves!" Some ready writer of the time to doubt made capital out of the coincidence; we are not aware, however, that anybody established any relationship with the rueful couple in the Guildhall of London, but it seems to be by no means improbable that the split giant, Goemagot, may have been condemned by the Fates to preside over feasts and revels of which they may not partake. We are not aware that this supposition opposes in any serious degree other theories with respect to the parentage of those well-known and time-honoured City worthies, Gog and Magog, and I dare say that it would meet with as much consideration from Niebuhr, and men of his stamp, as many other stories.

At the time of the French attempt, it appears that Plymouth was the fourth town in the kingdom, London, York, and Bristol alone exceeding it. The population, as estimated for the poll-tax imposed in the reign of Edward III., was 7,000. Leland, who wrote in the beginning of the sixteenth century, says: "The town is very large, and

at this time divided into four wardes, and ther is a captain yn eche of these wardes, and under each captain three constables. The mouth of the gulph wherein the shippes of Plymouth lyth is wallid on eche side, and chained over in tyme of necessitie. On the south-west side of this mouth is a block-honse, and on a rocky hill hard by it is a strong castle quadrate, having at eche corner a great round tower. It seemeth to be no very old piece of work."

The grand starting-point of Plymouth dates from the reign of Henry VI., who gave to the town a charter of incorporation, which established a municipal corporation, and empowered it to levy dues upon shipping, in order to undertake large defensive works.

Subsequent to this period Plymouth commenced its career of maritime discovery and colonization. Ships were fitted out by her merchants, and sailed out of the Sound under the conduct of Drake, Cavendish, and Oxenham. From this place was despatched the expedition that accomplished the *first voyage round the world*, under the guidance of Sir Francis (then Captain) Drake, who, according to one of his biographers, "was the first to turn up a furrow about the world." To show the spirit-stirring interest which the sea-faring inhabitants of Plymouth took in such matters, we are told that, returning one Sunday from one of his expeditions, the news penetrated the church, and caused the people to forsake the preacher, "to observe the blessing of God upon the dangerous adventures and endeavours of the captain." It was from Plymouth that Sir Humphrey Gilbert led the first company of Europeans to settle on the shores of Northern America, his heart burning with a missionary zeal to convert the aborigines. From Plymouth, too, let it never be forgotten, sailed, in 1620, what has been called "the soul of American Saxondom," in common with companies of pure-minded men and women from Delft Haven and Southampton, who preferred companionship with the savage creatures of the awful forests of that unknown land, to braving the fierce, relentless tooth of religious bigotry, which, because it could not bind the conscience, tore and lacerated the body that enshrined it. The religious persecutions in Europe populated America. Puritanism, driven abroad, takes root and flourishes. The weak thing—weaker than a child—becomes strong one day, if it be a true thing. It has since become one of the Powers of the world, endangered for a time by a canker at its heart, but now destined to attain to a splendour of existence little to be imagined.

Honour be to Plymouth, too, for that noble four days' encounter with the Spaniards, July 1588. England—say, Europe must acknowledge its debt with gratitude. We fancy we see the chased Scotch privateer rounding Penlee Point, and the admiral's face (Lord Charles Howard) when the brief intelligence reaches his ear—"My lord, the Spaniard is upon you." The vice-admiral, Sir Francis Drake, has already had some rubs with the Spaniard, and relishes the prospect; and two other Plymouth men—Sir John Hawkins (who, by-the-by, gained some unenviable notoriety in the slave trade) and Sir Martin Forbisher, are not slow to engage the foreigner. The Spaniards (a portion of the Armada) having heard that the English fleet had retired into Plymouth harbour, under the impression that their enemy was so discomfited by the storm as to be unable to take the sea again, hoped to take it in that trap, and crush it there. The English captains met the Spanish navy sailing up channel—a formidable power, with its wings seven miles asunder. It was allowed to sweep onward, favoured by the wind, and was then attacked in the rear, and thus the final stroke was put to an expedition which cost nearly every honourable family in Spain a son, a brother, or a

kinsman, and wrapped the whole country in mourning. This is one of those many dashing naval actions which drew from our bard an expression of that genuine British conviction, as firmly held now as ever—

"Britannia needs no bulwarks,  
No towers along the steep;  
Her march is o'er the mountain waves,  
Her home is on the deep."

Such are the scenes and events that make the men of Plymouth proud of their town. Patriotism gains force upon the plains of Marathon, piety grows warmer among the ruins of Iona; both sentiments may be quickened amongst the historical scenery of Plymouth.

It is seriously believed by some ardent lovers of their town, that the great purpose of the "*South Devon Railway is to afford them an opportunity of civilizing the rest of England.*" Those, therefore, who, during the next few days visit it, will have the opportunity of testing the effect of this influence, which, in the very nature of things, must be more of an historical than an agricultural kind. We suppose the Royal Agricultural Society has planned this visit to Plymouth with the most benevolent intentions. They fancied that Devon, with its neighbouring counties, required a fillip—that they dragged a little on the heels of progress, and required both stimulus and encouragement, and that because the Society's meeting was held at Exeter on the last occasion of its descent southwards, it must be held at Plymouth now.

Notwithstanding that Plymouth is not the most convenient place in the world, it is a most attractive one. There is so much to see, that we fear the visitors will hardly expend the amount of time within the Society's sacred enclosures that is usually expected of all advanced and advancing farmers.

Plymouth claims to be "the Athens of the West"—the people say that she has received the name from strangers. At all events, they stick to it as a right; and we are certainly indisposed to quarrel with the assumption which has found its way into the rhyme of some local poet—

"Then, Plymouth, hail! Queen of the West,  
Fast seated by the water;  
All-hail to thee, beloved one,  
The rushing Plym's proud daughter!"

The strong current of the English Channel, which has made a clean scoop in the coast, from the resistant Bill of Portland, carved from the Purbeck limestone, to Dartmouth, meets at the latter place with the old Devonian strata, which are less plastic. After it has washed round the protective caping of Llandoverly Rock from Start Point, to Bolt Head, it makes more impression; and the rivers from the highlands inland, rushing down with wild force, make great ravines for themselves, and working with the salt wave, throw the coast line into a series of strong indents. One of these, into which St. Christopher from the Eddystone heights casts his perpetual light, is occupied by Plymouth. After passing Penlee Head on the left, and Shag Stone on the right—three miles apart—one is fairly in the Sound. Thence Plymouth is just three miles off, occupying the band of limestone at the base of the bay, which is severed to allow the passage of the rivers Tamar and Plym, and is otherwise indented by the restless wave. Having made an advance of about a mile we come to the Breakwater, which, by preserving vessels from the south-west storms, made of the Sound a safe roadstead. This immense work, consuming 5,212,696 cubic feet of granite and 13,670,000 tons of limestone, was commenced in 1812, and finished at a cost of £1,500,000 in 1847. The whole work has a vertical height of from 56 to 80 feet. The centre part is a straight line extending 1,000 yards,

the deflecting arms or kants extending 350 yards, and this work, stretching between the Cawsand Bovisund Bays, leaves a passage for ships 1,600 yards wide on the west, and 1,000 yards wide on the east. The land on either side rises in lofty masses, here and there presenting the batter of a fortification, behind which lie guns and soldiers. Passing the west kant of the Breakwater, we glide along under the shade of Mount Edgcumbe, round which the river Tamar from the north-west has forced a channel which separates the promontory, of which it forms a part, from Plymouth. At the base of the Sound, having sailed under the lee of the grim-looking island of St. Nicholas, with its threatening fortress, lie the adjoining towns of Devonport, Stonehouse, and Plymouth, which might, and for my purpose must be, known under one name. Of this junction Devonport is on the west, Plymouth on the east, and Stonehouse, divided from Devonport by a long and wide creek, is in the centre. Devonport occupies a splendid position in the magnificent estuary of the Tamar, known as the Hamoaze, where the greater part of the British navy lie moored, sternly reposing in 18 fathoms of water. The face of the dockyard exposed to the Hamoaze is 1,160 yards in length, and the yard comprises 70 acres of land, a space cut up into basins and docks, or occupied by spacious wharves or storehouses and workshops. Then at Stonehouse there is the Royal William Victualling Yard stretching out far into the Sound, and the Royal Military Hospital. Leaping across Mill Bay from this part of Stonehouse, we arrive at the port of Plymouth, which is exactly *vis-à-vis* with the Breakwater two miles in advance. Plymouth has a variety of aspects: its glorious sea, and rugged cliffs, and multitude of trim-built boats and graceful floating yachts make it a most enjoyable watering-place; there are also sufficient manufacturing going on to give bustle and life to the streets—sawp, sail-cloth, Roman cement, rope, and twine being made there; the passing steamer and the white-sailed merchantman proclaim her commercial too, as well as the fact that on the quays are to be found the official residences of the consuls or vice-consuls of about 30 different nations. These three towns contain a population of about 127,000 inhabitants. The points of picturesque interest are wonderfully numerous. A man could scarcely stay long enough with his friends at Plymouth to exhaust the excursions that are to be made. Plymouth, the Citadel, the Cutwater, are to be looked at from the Victualling Yard, from Drake's Island, from Mount Edgcumbe, from Redding and Ravensness Points: the view west is to be seen from the Breakwater, from Bovisund heights, from Staffen Battery, from Mount Batten. From Point Tor a splendid view is gained of Devonport, and the Hamoaze, from Devonport of St. John's Lake, Point Tor, Mount Edgcumbe, and the estuary of the Tamar. The estuaries of the Tamar and Plym are celebrated, the one for its St. Germain's, Trematon, and Pentillie rocks, the other for its blue quarry and white water-fall, its ancient oaks cool rustling in the breeze; its sweet vale of Bickleigh, and rock-strewn valley of Cad. The Millbrook Lake, Stonehouse, and Sutton Pools, the Mill Bay, and the Cutwater all merit a visit and special inspection. These, together with the Dock-yard, the Citadel, and the Victualling-yard, which each claim separate attention, are likely to give the visitors sufficient to do, and to secure rather more attention than the stewards of the Society will like. Visitors must go prepared to make this a pleasure as well as a business trip, and so allow a little more time to it.

The space allotted to the show-yard is near Devonport, and the trial-ground is about one-and-a-half miles away on the Tavistock line of railway. Everything has been done, it is said, to secure a good service of trains; but, looking at the actual facilities of railway communication

possessed by Plymouth, we certainly fear, however good the arrangements, they can scarcely be such as to combine order and efficiency. There is but one line, and that a single line. The water communication, however, is excellent, and when people once feel their feet in this Western Athens they will find plenty of lodging room. In a space where 127,000 people are accustomed to move about there is sure to be accommodation for five or ten thousand chance visitors. The Duke of Cornwall, a limited undertaking, opened on the 1st July, the Royal Hotel, Harvey's Hotel, George-street, the Mount Pleasant Hotel, the Globe, Bedford-street, Chubb's in the Old Town, Farley's in Union-street, and various other houses of public resort are very willing to give to as many as they can an opportunity to judge of their cookery, their beds, and their prices.

On the splendid granitic debris of Cornwall potatoes and turnips both flourish. Potatoes the farmers grow very extensively. They break up two or three year old pasture for them, and then follow by wheat and barley, or oats followed by grass. The high table-land of the Penzance district supplies the London market with "Cornish reds" and "early kidneys" sufficiently forward to compete with the forced potatoes that arrive in that emporium from other quarters. The farms are usually small, and the farmers for the most part industrious men of small means, keeping cows, pigs in large numbers, and depending perhaps more on potatoes than upon any other root. As to the corn crops they are, at all events on the exposed table-lands, very precarious, and seldom well harvested. That outburst of granite at the Land's End affords the best scope for farming; the three other outcrops of the same rock that appear along the centre of the county yield soils of similar quality. The north-east coast is rather poor, the land around Callington is fine, and the south-east coast abound with a fertile staple. There is a great deal of waste land in common, and some of the lords of the manor are doing their best to induce the population to undertake its cultivation. The Earl of Falmouth has done much good in this way on the wastes of the clay slate formation. He has granted from three to five acres to cottagers on leases of three lives at very small rents, on condition of their building cottages on their holdings. In the year 1848, the Earl had 2,000 tenements of this description in the hands of miners, who had increased the value of the land from 10s. to 20s. per acre.

Devonshire will doubtless make a very handsome contribution to the Plymouth Show. We may admit at once that half the county—that lying north of Tavistock, consisting of the poor yellow sands of the carboniferous deposit—is dreary waste, and not to be utilized except when drained; but the remainder is superfine, either for the breeding or rearing of cattle or the production of milk and fruit, grain and roots. Nothing can excel that portion known as South Hams, comprising 160,000 acres. A line from Plymouth to Chudley, from Chudley to Torbay, and from Torbay to Plymouth by the coast, encloses it. The rich hazel-coloured marls of the new red sandstone, stretching from Tiverton to the right of Culhampton to Topsham and by the coast to Exeter, and then north to Crediton, and west to Hatherton, including the vale of the Exe, with that of Honiton, compose the richest dairy district. The cornstone and old Devonian strata north and south of the county, as in Worcester, Hereford, and Somerset, are most favourable and celebrated for the apple culture. The water-meadows, which form quite a singular feature of west-country farming, cannot be produced at Devonport, but their value can be judged of by results. We venture to recommend a visit, to those who want to know how to produce pastures over what appears to be the precipitous face of bare rock, to the hill farms which overlook the

Bristol Channel, both in this and the adjoining county. Abundant streams there cheerfully roll, chattering with rapid descents, among the mossy boulders. These the farmers lead about over hill-sides too precipitous for ordinary climbers, and the traveller is surprised to see far above his head bright patches of emerald green, glistening against the sun, with their thin film of water. The sloping face is chased with tiers of channels, each of which receives the overflow from the next above. Those who have to deal with hill-side and mountain streams may learn a valuable lesson here; and those who would make themselves acquainted with the ordinary mode of constructing and managing these meadows should wander about in those which border the Exe. Something is to be learnt here too. Four mountain torrents rush to form this stream. The Haddyo has the finest trout, and is the best for water-meadows. The Exe is moderate before reaching the city to which it gives its name for both. The Barle has poor trout, and is condemned for irrigation. The Danesbrook has no trout, and is also condemned. The Barle and Danesbrook, though clear as crystal, are brown as a cairngorm with bog water from Exmoor. The conjoint river is unfit for irrigation until it has received another stream of excellent quality near Bampton, but not till it has passed through Exeter is it used to stimulate the grass. Wherever it is possible to secure a plot of water-meadow with a farm it is always much prized, and in Devonshire and West Somerset this is usually regarded as a general arrangement.

Some time back a survey was made of the district fifteen miles round Exeter, extending over 37,000 acres. It was found that the average size of the fields were 4½ acres: out of 7,997 enclosures surveyed, 7,670 were less than 10 acres, and that 1,651 miles of hedges occupied 2,642 acres. This was supposed to be a fair picture of the entire county, and certainly not an encouraging one for steam culture. The relations of landlord and tenant, I hope, are improving. Not long ago it was customary for a farmer to hold without a lease, or under such a lease as to render good farming impossible. There is a less disposition to let land to the highest bidder, and much more to the practice of selecting a tenant for his known judgment and capital.

The peasantry are a contented and rather slothful race, given rather to the vice of turning themselves into cider-barrels for the convenience of their masters, who thus manage to get rid of a very large quantity of the second and third-rate beverage. They inhabit, as a rule, better dwellings than those we see in many counties. The walls are of cob-earth, a mixture of straw and sharp gravelly sand, which, when wetted and trodden by horses, becomes, when dry, a fine cement, hardening with exposure. Cob-walls two or three feet thick, are raised on stone foundations, and hold up a roof of thatch. The floors are of lime and sand, which set hard. And thus built, with four rooms to each, and a convenient outhouse, six cottages may be had for £250; and a man with a family can hire a comfortable home for 1s. a-week, with a rod of land attached.

The hill district of the east is very different to that on the west: it does not consist of distinct lines of hill divided by deep stream-valleys, but gradually slopes away from the top of the limestone ranges to the rivers Avon and Frome. This district is more varied than any similar district in England, yet it is remarkable that various circumstances have tended to perpetuate an uniform system, under which less capital is invested and more rent paid in proportion than is the case anywhere else, comparing it with districts equal in extent. The marsh lands mainly lie in the middle of the county: those of Bridgewater are well known. The best of them are capable of grazing a bullock and subsequently wintering two sheep. They are

mostly rented by west-country farmers. The second-class grass land is used for dairy purposes, and produces that cheese of which fine specimens will be seen under the sheds in the show-yard—we mean Cheddar. The contents of the farms usually vary from 50 to 120 acres. Each cow requires about 3 acres, or its produce the year round in summer grass and hay. The milk of thirty cows makes one cheese of half a hundredweight daily; and a good cow on good land will yield per annum 4 cwt. of cheese. Somersetshire is still sleepily following the march of progress, although awakened on three sides recently by the Royal and Bath and West of England Societies.

From what has been said, it will not be expected that steam culture has made much way in the district thus hastily defined. Devon and Cornwall have made not even a beginning. The land which is cultivated is for the most part very light. In the midlands of Somerset, the farmers seem to appreciate the value of this auxiliary force in dealing with the heavy clays of the marsh levels, and in Dorset there are some sets of tackle at work. Howard and Smith seem to have the advantage of Fowler in these localities, but altogether there are but sixteen sets of tackle in operation.

### THE IMPLEMENT TRIALS.

Wednesday being the opening day of the great competition between reapers and reapers, drills and drills, rakes and rakes, hoes and hoes, we were determined to be early on the scene of operations, in order more leisurely to see and describe; and allowing an hour or so for the judges to walk round the yard, send out implements to the trial-yard, and so on, we calculated that ten or eleven o'clock might strike before grass or corn began to fall before the noisy knives, or drills to jingle the coulter-tins over the brown arable. But where to go?—that was the first puzzle. And how to get there?—that was another difficulty. The Society's own advertisement said that "The Show-yard is at Penny-come-quick—it will be a lucky thing if they have not to rechristen it Penny-come-slow—about one mile distant from the railway-stations of Plymouth and Devonport." And furthermore it announced a "trial of field-implements on Woodford Farm, Plympton St. Mary. Distance, by rail or road, 3½-miles from the Show-yard." We ask, therefore, at Plymouth station for a ticket to Plympton. No such thing, however: the train did not stop at Plympton—and, if it did, that was not the place where the implement-trials came off. We must travel to Marsh Mills; which, accordingly, we did. Alighting there, upon a new platform just constructed for the occasion, turning the water corn-mill siding into a sort of station—without booking-office or clerk—we inquire when it will be possible to go back again? The answer is, "At one twenty-five, and the next train at five minutes before seven." This was all the rail accommodation for the thousands of sightseers likely to flock out of the dockyard cities to the battle of the reaping-machines. Worse than this, however: no person was suffered to travel from the trial-fields into Plymouth again without a return ticket, no tickets being issued at the Marsh Mills Station. The consequence was that hundreds of people were disappointed of a ride, and had to journey on foot, or as best they could; the railway losing fares, and the trial-fields much of their popularity. Arriving on the ground about eleven o'clock, we inquired for the judges and the machines: not a single tool had made its appearance, and we could only loiter about the fields, survey the pretty landscape, sit under a great

hedge growing on a bank, the fashionable fence in this country, look at the crops and land provided for the experimentation, and wonder with people who had assembled since seven o'clock in the morning when "them wur a' comin'." In the course of hours some machines actually did reach the ground; drills were ranged in a pasture to wait their turn next day, and the reapers were fitted together and got ready for work as fast as the teams of stont horses brought them up. By-and-bye, the rosy face of the consulting-engineer was visible in the bustle; the judges and stewards appeared with their button-hole badges, and their books in hand; orders were dispatched in all directions, and, as a beginning, the exhibitors of machines congregated to draw lots out of the hat. As far as we could make out, the matter was fair enough: you draw a number, and take your chance of a good or bad plot accordingly; but it seems that all exhibitors should have drawn their lots; whereas, some few did not appear at the first call, and had number-tickets allotted to them afterwards. But not much difference existed in the crop to be cut, excepting a little perhaps in favour of machines that should be among the latest tried. Well, waiting patiently is, or ought to be, one of the cardinal virtues, and this was rewarded by witnessing one of the grandest trials of reaping-machines ever seen, and which commenced in due course at a quarter-of-an-hour before five o'clock.

The class to be first tried was that of manual-delivery machines, twenty-five of which were ordered to the field. What was the field? Why, twenty acres of corn, one-half bright upstanding rye, the other half very heavy, storm-broken, green oats, a severe test for any machine; yet this was all the scope provided for two or three scores of machines. The fact is, people began to suspect at once what is the real truth of the matter; a day or two's testing of such a number of reapers, machines that need trying in all sorts of crops on flat land, ridge and furrow, and long enough to prove their probable durability, can only be a scamble, with "Here's to good luck," and "Three cheers for jockeying;" and, therefore, the use of such public field-days as these consists in giving the public an opportunity of seeing the machines work if only for a minute, and in weeding out a number of tools that may make evidently inferior work, thus leaving a first-class competition of only a few machines to be subjected to a prolonged trial hereafter. No doubt this will be the course pursued on this occasion: the judges, Messrs. Caldwell, Coleman, Martin, and Wortley, with Mr. Bramwell, C.E., as engineer, are too practical and too bent on satisfying themselves and the public, to raise or damage the reputation of any great manufacturing firm for four years by awarding prizes after a make-believe race like this. These gentlemen are as anxious as the stewards are, to give each machine its due; but the public must be favoured as well, and the public admitted to the field, scare the horses, press upon the work, hustle the officials, and spoil the whole investigation—all in the best possible humour.

The Beverley Company's machine had charged into the crop, the day before, and admirably cleared a breadth all round; but the first machine now had the disadvantage of not following its own work. The second machine, again, laboured under a similar disadvantage, in having to follow the first, and so on; for time would not allow of a plot being assigned to each reaper by itself. All that could be done was for each machine to cut along one side and one end of the ten-acre piece of oats; and, to tell the truth, most of them found this single breadth of such a crop to be quite sufficient. Every bystander observed that the machine that could cut this green, long-strawed, lodged, amazingly-broken and twisted crop, could "cut anything." Page's machine (No. 1056 in the Catalogue),

led off the ball. It is of the Hussey form, with a tipping platform, this platform neither horizontal nor sloping, but the forward half flat and the backward half inclined, forming an obtuse angle. When packed for travelling the machine rides upon three wheels, temporarily added for the purpose; and the shafts are attached end-wise, in a line with the axis of the main driving-wheels, only a few minutes being required for removing the wheels and fixing the shafts in their usual place. This is a convenient arrangement for easily passing through gateways, and is adopted in several of the machines exhibited at Plymouth. The next machine which tried its bout was that of Burrow (No. 943), of very similar build, with tipping platform, and packed in like manner for travelling. Then came Bowhay's machine (No. 260), that took a prize four years in succession, when the Bath and West of England Society condescended to the vanity of such competitions. The peculiarities were two-fold: first, there is one knife-bar fixed, with another oscillating in the usual manner over it, thus giving the greatest possible amount of cutting action; and secondly, the tipping-platform is divided, the backward half dropping, and the forward half slightly rising, but so peculiarly arranged that this rising half can be lifted by the foot of the rakeman, to assist in tossing the sheaf off. Next came Picksley and Sims' machine (No. 1662), an improved Hussey, with shafts, a "pendulum" sling to lessen the friction of the connecting-rod end of the knife-bar, a main-wheel of large diameter, and a tipping-platform so made that the backward half drops with the weight of the sheaf and the downward pressure of the rake, a counterbalancing weighted lever raising the drop-board directly the corn is off. Up to this time the machines met with frequent stoppages, chiefly arising from the inability of the rakemen to deliver the stuff; and this inability was due to various causes. The horses, frightened by the crowd, rushed on at too rapid a pace for cutting anything but a very light crop, and that could not be moderated, although, in some cases, two horses, tandem-fashion, were used in a "one-horse" machine, with a view of going steadier. Some of the men, too, anxious to perform wonders, took too large a breadth at once; and then the crop itself was so tangled that only the cleverest rakeman in the world could deal with it. Things went a little better when a cordon of policemen, holding together by handcuffs, surrounded the team, the machine, and the officials; but, of course, the crowd of followers obliterated all idea of how the stubble was left or the sheaves laid, excepting for the very short bit of ground that could be seen at once. Picksley and Sims' two machines did excellent work, as far as we could judge; but the tipping platform, while a real facility for delivering a medium or light crop, is clearly a hindrance to the man in such a tremendous piece of oats as this. The only machines that we saw on this first day pass through their whole course without stoppage, from choking or inability of the man to deliver, were those of R. Cuthbert and Co. (Nos. 376 and 377). These strongly-built machines, exhibited without paint upon the wood-work, and all the various parts strengthened where required after a very lengthened experience upon all sorts and conditions of land and crop, are an improved form of the old Hussey machine, but with shafts instead of a pole. The friction of the knife-bar is reduced by a long pendulum sling; the platform is simply a flat board, without any tipping action; but this year there has been added a wooden roller of a few inches' diameter, across the back edge of the platform, intended to ease the sliding of the corn off the board. Mr. Cuthbert, who has had more practice with the rake than any other man in England, persists in declaring that the tipping platform is useless in a very heavy crop, while for medium and light crops it is most required; however, we do not agree with this opinion as far as



medium crops are concerned; our experience, as well as observation, assuring us that the sheaf is more easily delivered with the tilt, excepting where an excessive weight of crop calls for all possible exertion of the rake-man's arms, leaving his foot no opportunity for anything but sticking tightly to the leather loops on the platform. Both of Cuthbert's machines, the so-called one-horse and the two-horse machine, passed along the two sides of the crop without a stoppage, the stubble being left short and even, and the sheaf bunches well laid behind. The horse was led at a fair natural pace, unfurried by the crowd; and this was one point in the machines' favour. Then the rake-man did not try at too much, and was satisfied at taking only part of the full breadth of cut, as the whole would have given him too much to deliver. General satisfaction was expressed at the excellent performance of these machines, and the completely successful manner in which they coped with such a heavy, tangled, and green-strawed crop.

So ended the work of the first day's trials. For the judges of drills and other machinery merely looked over the ground prepared for their operations, and marshalled the red and blue implements in long rows, in readiness for the morrow's contest. Thursday came, and with it a drenching rain, a sort of mixture of cloud, wind, and water, that poured, and swept, and blew, and splashed all the way from our hotel to the station, all the way to Marsh Mills, all the way thence to the trial fields, and kept on all the morning as a regular "Plymouth dirty day." Nothing daunted, the judges and engineers were at their posts, and, of course, representatives of the press were not less resolute and determined. Morning and afternoon we paddled about the fields, with coat and boots soaked through, and umbrella useless, hiding under trees where the drip became more intolerably penetrating than the down-pour of rain in the open; but, alas! no sign of clearing appeared; and all the judges did all day, in forwarding business, was to try three of the manual-reapers, namely, Samuelson's one-horse machine, Wray's one-horse reaper, and Maunders' one-horse reaper. Samuelson's machine is of remarkably simple construction: a toothed segment on one side of the main wheel drives a small pinion on the crank-shaft, and this is all the gear-work about it. The speed of the crank-shaft is not great, but the velocity of the knife-bar is obtained by means of a long stroke, each knife passing across two spaces between the fingers, or double the ordinary distance. Whether the extraordinary simplicity and lightness of the many parts may be an advantage sacrificed in extra friction, from the smallness of the pinion, is a question; but as the motion is not of great rapidity, like that driving the drum of a thrashing-machine, the example of the old horse-power thrashing-machines does not apply to this case: it is to be settled by actual experience. This reaper has a tipping platform covered with zinc, and the action in the wet heavy oats was satisfactory.

Orders were given for the competitors and the officials to be on the ground by "eight o'clock, sharp," next morning; and accordingly Friday (a splendid bright day) found a crowd of people busy till late in the afternoon, watching operations, and meeting with rather better travelling accommodation from trains and cabs and 'busses. The corn being still soaking wet, work was undertaken with the grass-mowers, in what is called the marsh—a piece of flat meadow-land in a valley contiguous to the Marsh-mill Station. This "grass," so-called, was in reality about two-thirds thistles, and other luxuriant weeds, among a thin sward of grass, thick only at bottom; and the surface was uneven, with the grass beaten down upon it by the weight of rain. The field was staked out in plots, the lots drawn; and

the machines were tried in turn, by cutting twice round the plot, and then going round with the draught-dynamometer attached. First came Bamlett's machine, which made fair work throughout, and that with few stoppages. Next came Burgess and Key's new mower. This is one great novelty of the meeting, and demands a special notice: all we can do here is to point out the main features in its construction. Hitherto the crank-shaft of any mowing machine has been placed considerably above the level of the knife-bar, because it had to pass over the cut grass; and the angular thrust of the connecting-rod involved great friction and loss of motive power. In this new machine all the gear-work, the crank-shaft, and the connecting-rod lie in the smallest space, packed as it were, not in a frame between the two carriage-wheels, but outside the carriage or main-wheel, between that wheel and the standing crop. In fact, the whole mechanism, with the framing which carries it, travels over the narrow track cleared by the track-board during the preceding bout; and as there is here no grass lying in the way, the crank is close to the ground, and the connecting-rod working in a line with the knife-bar. And the connecting-rod, so far from being too short, is of the proper theoretical length—that is three times the throw of the crank—thus avoiding the weakness of a long connecting-rod. The machine is remarkably light, weighing little more than half as much as Messrs. Burgess and Key's old machine, yet with ample strength in every part. In working, it was manifest that no clogging could occur, from the low position of the working parts; but several stoppages did occur in the cutting part, the fingers being too short for this particular kind of low weedy crop. It is a pity that, from a trifling oversight in not providing for such a ragged and wet-flattened meadow as this, the merits of a clever machine should hardly have a chance of display; for the very point of lightness of draught could not be shown when the cutters caught and tore up considerable portions of the low matted grass; yet everybody knows that Messrs. Burgess and Key's machines can cut with perfection in all ordinary circumstances. Samuelson's machine has some good contrivances, placing the whole working under instant command of the driver, without his having to use his hands for anything but guiding and managing his horses. He puts in and out of gear by his heel. He raises the cutter-bar by a stroke of his foot, and a spiral spring comes into play, easing the movement of the cutter-bar in passing over ridges and furrows. Barber's machine came next; peculiar for its enabling the driver to lift up either end of the cutter-bar at pleasure, and with great facility. Dicker's machine did not show any special merit. A new principle appeared in Child's American "clipper" machine. The cutter-bar is forward of the main wheels, but a draught-iron connects the whippletrees with the framing instead of with the axle; thus tending to lift the cutter-bar and relieve the machine of draught arising from the downward thrust of the cutter-bar upon the ground. By a lever, too, the driver can twist the finger-bar while the machine is in motion, so as to give more or less "pitch" to the fingers and knives, according to the requirement of the crop and the nature of the ground. Samuelson's combined machine was next in order; then came Kearsley's "Backeye" mower, made with a wrought-iron frame, doing excellent work. Pickaley and Sims' machine worked uncommonly well; and next, came another machine of Bamlett's, with an iron instead of wooden framing. Wood's mower, with jointed finger-bar and long sharp-pointed fingers, was next in succession; this machine cut beautifully level, and without a stoppage, gaining great favour with all lookers-on. Wood's machine, with rigid-bar, cut well, but could not keep on without several stoppages to clear the knives. This



machine appears stronger made than when it first came out years ago. Then came Burgess and Key's old substantially-built machine, cutting splendidly, and without any stoppage. Lastly, Hornsby's mower made capital work in every respect; in this machine, the finger-bar, in advance of the main-wheels, can not only rise and fall, but accommodates itself to small undulations of surface by a twisting movement given by a castor-wheel travelling in front—the hinge of the lever-frame and the connecting-rod having a spherical joint and bearing, to allow of all alterations in position. No cast-iron is used in the framing of the machine.

As the ground was somewhat better at the far side, machines which had the higher numbers were very fairly brought back for a second trial on the near side of the field, to prevent any complaints as to favourable or unfavourable conditions. Whatever the judges' award may be, it is obvious that it will only express the relative value of the machines on this miserable crop; a lengthened trial on a heavy Middlesex meadow might tell a very different tale. A smart half-hour's performance takes the eye, and proves certain merits: the more material point of durability must be left to the individual judgment of purchasers, and the testimony that is forthcoming from users of the machines.

The next competition was with the combined reaper and mowers, namely, the machines of Messrs. Samuelson, which made prime work; two machines of Bamlett, which did not succeed so well; Kearsley's which cut fairly; Wood's, which cut very clean without mishap; Barber's, which worked tolerably well; Burgess and Key's, which made very good work; and Hornsby's, which cut well. Then the judges had Wood, Burgess and Key, and Hornsby, following each other; so that no favour or affection should be shown in the matter of ground; and their day's proceedings closed with a resumed trial of the manual-delivery reapers—Page's, Wright's, Wood's, and Brenton's being put through their paces along two sides of the oat crop, now worse laid and broken than ever. Wright's managed pretty well; Wood's tipping slat platform worked satisfactorily; but Brenton's, with roller for delivery, failed to do its task.

The judges of drills, &c., Messrs. Hicken, Thompson, Sherburn, and Johnson, assisted by Mr. Dyson, C.E., had a hard day's work on Friday, with such an array of red-wheeled implements awaiting them as to forbid any completion of their labours until Monday or Tuesday. Conspicuous among the drills were those of James Coultas. They are fitted with copper pipes to resist the corrosive action of manures; with shields to protect the toothed wheels and the outer coulters from dirt; the carriage-wheels are upon patent hooded arms, with oil-caps like those of a gig, and all the motions run in brasses. The manure box has a sliding stirrer just "in the throat," where stoppage generally takes place, and the coulters are of wrought-iron and steel. The fore-carriage steerage is the simplest possible, yet placing the man in full command of a straight line. Hornsby's drills have cast-iron chilled tips to the coulters, renewable like ordinary plough-shares, and the coulters bars are so arranged as to be adjustable at different heights, for giving more or less pitch. This is an improvement of more advantage in a horse-hoe than in a drill. The barrel of this manure box is well arranged, forming the bottom of the hopper, with regulating doors that permit the regular escape of the smallest quantities of guano. Hawke's seed and manure drill introduces a new principle, that of delivering by means of endless belts or chains. The chains drawing through the manure take out small portions upon the links; and endless belts with holes in them passing horizontally through the seed-box distribute in quantities according to the size and

distances of the holes, which fill themselves with the seed. A more valuable novelty is Saintry's patent, exhibited by Messrs. Garrett. The old weights and winding-barrel and chains are done away with; each lever carries a spring, and all can be lifted or lowered at once by a light bar frame. Excepting on cloddy land, or where frequent ridges and water-furrows prevail, this will be found a much lighter and better implement than the weighted coulter drill. The same arrangement of springs answers still better upon the horse-hoe. One novelty shown is Holmes' rotary forker, a new form of an old idea, but well carried out, and likely to be an efficient tool upon light soils, for making a good seed-bed of ground previously ploughed, and tossing out rood-weeds upon the surface. The implements in this department tried up to Saturday night are as follows: *General purpose drills*, of Coultas, Hornsby, Priest and Woolnough, Holmes, Reeves, Tasker; *corn drills* of Wallis and Haslam, Priest and Woolnough, Holmes, Hornsby, Reeve, Tasker, Saintry, Coultas, Hunt and Pickering, Gower, Gilbert, Freer, and Hawkes. *Small-occupation corn-drills*, of Holmes, Tasker, Priest and Woolnough, Gilbert, Saintry, Reeve, Gerrans, Lewis, Hornsby, Gower, Hunt and Pickering, Coultas, and Eddy. *Hill-side delivery drills*, of Holmes, and Coultas. *Turnip drills "on the flat,"* of Reeves, Brenton, Hornsby, Holmes, Tasker, Freer, Wallis and Haslam, Priest and Woolnough, Gilbert, Coultas, Gerrans, and Gower. *Turnip drills "on the ridge,"* of Reeves, Gower, Holmes, Priest and Woolnough, Mellard, and Burton. *Small-seed drills*, of Coultas, Holmes, Hornsby, Priest and Woolnough, and Reeves. *Drill pressers*, of Gower and Sons, Gerrans, Hornsby, and Tasker. *Dry-manure distributors*, of Coultas, Brenton, Reeves, Saintry, Hornsby, Bowhay, and Priest and Woolnough. *Liquid-manure drills*, of Reeves, and Coultas. *Liquid-manure distributors*, of James, Reeves, Baker, and Saintry. *Horse-hoes "on the flat,"* of Priest and Woolnough, Lewis, Munn, Saintry, Hunt and Pickering, Hornsby, and Smith. These were tried first upon young rye, then upon turnips. When it was known that many of these makers had more than one drill in the same class, the labour that the indefatigable judges have gone through will be appreciated; and their task is yet far from ended.

Saturday gave a bright forenoon for the resumed trial of manual-delivery reapers, but rain in the afternoon hindered proceedings; and though the grass-mowers and combined grass-mowers and reapers were tried on the marsh grass and on a piece of very rough clover and ryegrass upon a hill-side with another test of the dynamometer on the selected machine, the haymakers and horse-rakes were all left waiting for attention on Monday. Elaborate tabular statements are prepared by Mr. Amos, giving the breadth and area cut, the time engaged, length cut, draught in pounds, actual horse-power employed as shown by the dynamometer, and so on—very valuable as guides to the judges, and full of information to the public when afterwards published in the Society's Journal. It may be useful just to give here a very few of the calculated results for some of the selected grass-mowers, to which we may add a few data extracted from information obligingly furnished by the makers of the machines. Burgess and Key's Allen mower took a draught of 339.5 lbs.; cutting at the rate of nearly 2 acres per hour, the price £25. Barber's Eagle mower, price £22, cut at the rate of 1.63 acres per hour, with a draught of 355 lbs. Kearsley's Buckeye mower, price £22 10s., cut at the rate of 1.91 acres per hour, with a draught of 337 lbs. The lightest draught was that of Wood's mower, price £22, which cut at the rate of 1.85 acres per hour, with a draught of 267 lbs. The total weight of this machine is 54 cwt. The greatest

draught was that of Hornsby's mower, which cut at the rate of 1.81 acres per hour, with a draught of 432lbs. The weight of the machine is 7 cwt., the price £22. The weight of the machines, however, has little influence upon the draught in work; extreme lightness may or may not be compatible with durability and strength to contend with heavy crops: the extra power required by Hornsby's machine was due partly to the extremely low shaving of the grass (in which point it surpassed the other machines), and still more to a difference in the mechanical working parts. Hornsby's knives being much longer than Wood's, they encounter greater resistance to their motion; but of course they cut all the more at each stroke. Details in the form of knife, and so on, are of the greatest importance; when we see how soon a great increase of draught is occasioned. And Burgess and Key's beautiful new mower failed to make superior work, probably because of a little deficiency in the fingers: they project only 1½ inches beyond the ends of the knives; whereas in Wood's machine, the fingers are sharp-pointed and project 3 inches in front of the knives.

The remainder of the manual-delivery reapers were tried on Saturday morning. Bamlett's machines acquitted themselves tolerably well, particularly one with shafts, and a bent-axle fulcrum for the tipping-platform, by which it can be adjusted to different heights. Dicker's has common door-springs under the platform, instead of a balance weight; and Brenton's machine has a roller for delivering the sheaf, put in motion by a foot lever raising one end and pressing together two smooth wood riggers; neither worked with satisfaction. Wood's reaper showed the advantage of a slatted tipping platform, and Hornsby's very similar machine did equally well; neither of them, however, equaling the masterly performance of Cuthbert's machine, with flat immovable platform. Hornsby's new machine, a combination of the slat platform with a lower fixed platform and endless chain delivery, worked admirably even in this tremendous bit of oats, that will be remembered by the makers for many a day to come. This is the novel machine of which we spoke favourably at Hereford; and its feats here prove that our judgment was not mistaken. The man parts the standing crop with his rake, and collects the stuff upon the slanting slats; then lifting his foot, the sheaf is

gone without any more exertion or trouble; and if the rake is used to hold off the standing corn until the sheaf has slid away, the sheaf is deposited with parallel straws and a stubble end square across, in all but the most raffled crops, which no scythe-man or sickle-man could make neat work of. The sheaves, too, are delivered far enough out of the next track of the horses. The price of the machine is £28.

The self-delivery machines began with Samuelson's two-horse reaper, with rotating rakes, which certainly made uncommonly good sheaves for such a crop. The Beverley Company's two-horse reaper cut well, and delivered a neat continuous swathe. This machine has been much improved this year by lowering the slope of the platform, and by various alterations in the driving gear, supporting frame of the reel, and so on; and is now a first-rate and very popular tool in districts free from ridge and furrow. Samuelson's self-raking reaper (No. 1) did not deliver well; and Holland's strange composition of knives, rollers, scaffolding, and tarpaulin, proved very forgetful, running over the crop without remembering to shear it. Hornsby's endless-chain swathe-delivery reaper was not very successful; cutting well while it would go, but frequently clogging up from a mishap alleged to have occurred on the railway. The Beverley three-horse machine astonished the crowd of spectators by its wide cut, and the ease with which it delivered a great weight of stuff, though it met with frequent stoppages; and in this, as in the performance of other self-delivery machines, people observed the quantity of shelled oats littered upon the ground and upon the platform. Burgess and Key's M'Cormick reaper cut beautifully; but the bulk of stuff was more than the reel-rake, with its curious movements, could deliver neatly. A better result was obtained with their newly improved reaper, in which the rake has an easier motion, without shock, and the whole frame-work is made lighter, yet equally strong. Probably this class will be tested on Monday on a more reasonable crop—the nine acres of ripe rye a little further up the hill-side, which seems reserved for a final competition of selected machines. Wood's self-raking reaper introduces the rake into the standing crop at the side, instead of dropping down into it from the top; and this seems right in principle, if it can only be made to deliver a sheaf in form less like a lady's fan.

## KINGSCOTE AGRICULTURAL ASSOCIATION.

On the 21st July Mr. Church delivered his sixth lecture on chemistry. The subject treated of was *water*, which it is important to be able to analyze readily, whether used for household purposes, for cattle, for steam-engines, or for irrigation. We find water in three conditions—as ice, water, and steam or vapour. A great many substances are dissolved in water, similarly to the familiar instances of salt and sugar. Among these are bi-carbonate of lime, an organic matter both animal and vegetable. The rain-water collected from roofs of various kinds is found to vary very much; for instance, that from a slate roof is nearly pure, as there is no carbonate of lime in slates—so from common burnt tiles; from such roofs plants do not grow, so there is very little organic matter derived from them. The stone tiles of this neighbourhood, quarried from the Stonesfield slate, contains a good deal of lime, and plants grow readily upon them; so the rain-water from them, after they have been exposed a few years, contains both carbonate of lime and organic matter. Supposing some water be given; to determine what it contains. The first gene-

ral test would be to determine its colour. Pure water is of a light blue colour; if you look down through such water fifteen feet deep, the colour is very similar to the beautiful blue of the sky, and it is supposed that the sky owes its blue colour to the vapour it contains. To determine the colour, take a tube of clear white glass, about two feet long, and grind one end of it, so as to have a perfectly flat surface; place this surface firmly on a flat piece of glass, laid on a white piece of paper, on a table; fill the tube with the water to be tested: if it is of a light blue colour, it is probably pure; if green, brown, or yellow, the reverse. It is requisite sometimes to filter the water, to remove any earthy particles in suspension. The green colour is frequently derived from the presence of plants, which can only be detected by a powerful microscope, and so small as to pass through the filter paper, and the water is sure to be unwholesome; the brown or yellow colour is generally due to the presence of iron and organic matter. The *second test* is the *taste*. This suggests itself readily to anyone, but it is important to know that after heating the water to 80 deg.

or 90 deg. the bad taste is very much increased. It should be allowed to cool a little before tasting. The *third test* is the *smell*. This is likewise greatly increased by warming to 90 or 100 deg. The next tests are *chemical*. 1st. After heating as above, add a little quick lime. If there is a smell of ammonia (common smelling-salts), some animal matter, sewage, or drainage from the yards has reached the water. It is requisite, however, first to try the lime with some distilled water, as the lime is occasionally itself impure. Potash or soda would do as well as lime. On the addition of the lime the chlorine of the chloride of ammonium, which is present in the water, seizes the calcium of the lime, and forms chloride of calcium—one part of the hydrogen of the water takes the oxygen of the lime and forms water, and the ammonia, composed of the remaining one of nitrogen and three of hydrogen, is liberated in the form of gas. In the London and plastic clays, and the clay at Pirton (the Oxford), there is present carbonate of soda. The water is soft, sometimes almost soapy, very alkaline. The test for this is: Take the petals of a purple dahlia, violets, or any other purple flower, infuse them in water, steep some white blotting-paper in the infusion, and dry it; on testing the water with this prepared paper it turns green if the water is alkaline, red or scarlet if it is acid. Thus, sulphuric acid turns it scarlet; carbonic acid, a dull red. The next test is Clark's soap test, for determining the hardness of water, which will be fully explained in the next lectures. The importance of being able to test the water readily is frequently evident when it is used for steam engines, as carbonate of lime for instance is so frequently found incrustated on boilers, causing great loss of fuel, by checking the transmission of heat, if it is not sometimes the immediate cause of explosions. When there is an excess of carbonic acid in the water, a large quantity of carbonate of lime may be present. An ordinary quantity of carbonate of lime present in water is 1 in 11,000; but when carbonic acid is abundant, we may have 20, 30, or even 40 grains sometimes in a gallon. When the quantity is thus large, boil some in a flask, and apply Clark's soap test. After the water is boiled for an hour, crystals will be found to form on the sides of the flask. If carbonate of lime is present in a large quantity, add a little common vinegar or some acid, and the carbonic acid will be disengaged with effervescence. The following are some tests for special impurities:—1st. Iron—chalybeate water. There is generally a yellow deposit from the water. This water, though not pleasant to drink, is used as a tonic. Test, tincture of nutgalls, which gives immediately an inky infusion. A piece of iron was put in some water: the nutgall tincture added showed immediately the presence of the iron. This test detects the presence of very minute quantities of iron. A strong infusion of green tea produces the same result as the nutgalls. 2nd. Lime. The test for lime is oxalate of ammonia. When added to the water, oxalate of lime is formed, falling in a white precipitate. An experiment tried with distilled water showed no lime, but with water from Hunter's Hall a slight but immediate white precipitate. The oxalic acid may be obtained from common sorrel, mangold, or rhubarb leaves; by collecting this precipitate and burning, but not too strongly, we may determine the quantity of lime in a gallon; or by allowing the water to evaporate, and leaving the deposit exposed for a short time, the oxalic acid will escape, the lime will take carbonic acid from the air, and it may then be weighed as carbonate of lime. There is generally some carbonate of lime in water, but some waters are remarkably free from it; for instance, that of Loch Katrine, which is now carried to Glasgow for the town supply, contains only  $1\frac{1}{2}$  grains per gallon; and the water of the Loka stream, in Sweden, is so pure that there is only 1 grain

in  $19\frac{1}{2}$  gallons. On this account the filtering paper that is there made is highly prized by chemists when very careful analyses are required, as the paper, like the water where it is made, is so free from carbonate of lime and other impurities. 3rd. For organic matter. In a free soil great caution is required to prevent the water from the sinks, &c., escaping into the well. In some wells at Cirencester the sewage, &c., thus escaped into the wells, and the consequence was a constant low fever in the district. When suspected, heat the water. It smells disagreeably; this is the first test. The next test used is permanganate of potash, which is used for giving glass the beautiful purple colour, owing its colour to the combination of manganese with oxygen, as manganic acid. When the water containing organic matter is mixed with this test, it has so great an affinity for oxygen that it takes it away from the manganese, and with it the purple colour. Thus, if the water is free from organic matter, the colour remains; and if the water is not free, the colour flies. This permanganate of potash is used as a disinfecting fluid, sometimes by tobacco smokers, spirit drinkers, &c., and acts by decomposing the animal matter. To show how powerful and delicate this test is, some of the tincture of nutgalls was added, and the colour was immediately taken away; four grains in 10,000 of water may be used as a test, and if this be made always of the same strength, it is easy to compare the relative impurity of different waters by it. 4th. For nitrogen. Where nitrogen is present in water it is generally derived from some escaping animal matter. Flesh, horse-hair, all contain nitrogen, and are called nitrogenous substances. The nitrogen is in the form of ammonia, nitrous, or nitric acid. These are found also in dew or rain, but in very minute quantities, and not so as to be injurious. In the Cirencester wells as much as  $10\frac{1}{2}$  grains of nitrate of lime was found in a gallon of water, caused by the water from sinks, privies, &c., finding its level, and percolating through the porous soil to the pump. When there is oxygen in the soil the animal matter is destroyed, nitric acid is formed, liberating the carbonic acid of the carbonate of lime, combines with the lime, and, as nitrate of lime, passes into the well. To test the presence of nitrogen, add one or two drops of sulphuric acid, then one or two drops of iodide of potassium, mixed with starch paste; if impure, the mixture becomes intensely blue. Test for nitric acid: Take a little indigo and dissolve it in sulphuric acid. Dry up the water to be tested in a porcelain basin, drop the solution of indigo on the basin; the blue colour will be destroyed as drop by drop falls, until all the nitric acid contained in the matter left from the evaporated water is destroyed. Sulphate of iron is another test for nitric acid. A little diluted nitric acid was put in a test tube, a few drops of sulphuric acid added, and a few crystals of sulphate of iron (green vitriol) were added; in a few seconds the crystals became brown. Test for sulphuric acid: Sulphur is found in all animal matter; and as this decays, the sulphur combines with oxygen and forms sulphurous acid—sulphuric acid. In the same manner are phosphorus and nitrogen from animal matter oxygenized by the decay of the animal matters, and thus become useful as food for plants. The test for sulphuric acid is to take a drop or two of vinegar or nitric acid, add chloride of barium; a white precipitate shows the presence of sulphuric acid. The Hunter's Hall water showed very little precipitate, and was pronounced by Mr. Church to be very pure water, containing some carbonate of lime, but almost free from other impurities. As some of the water at Cirencester contains as much as 6, 8, and 10 grains of nitrate of lime, its excellence for irrigation may be thus accounted for. The class was requested to try some of the waters in the neighbourhood before the next lecture.

## FOREIGN AGRICULTURAL GOSSIP.

We have to announce the unexpected death of M. Caillaud, sub-director of the Grignon imperial school of agriculture. M. Caillaud, at the time of his death, was only 61 years old. He was a civil engineer of mines, and had devoted himself successfully to various chemical works, when M. Bella, sen., called him to his aid. He remained attached to Grignon for 33 years, and he brought as much zeal as intelligence to bear upon the functions with which he was successively charged. He published a work, in four volumes, entitled "The application to agriculture of the elements of physics, chemistry, and geology." This work, which was very well written, was the substance of "courses" which he had "professed" for several years to the pupils of Grignon. The credit accorded by the French Corps Législatif this year for the various "services" of agriculture amounts to £157,140 as compared with £146,812 last year. Several "services" will be better endowed, more especially the allocations given to agricultural societies and veterinary schools and committees. It appears, in fact, to be now generally admitted by the French legislature that the funds devoted to the encouragement of agriculture constitute an essentially productive expense. The Corps Législatif has been occupied with the sufferings of French agriculture; but at a moment like the present, when the new crop may modify the situation, the various speakers on the subject have shown themselves very reserved in the expression of opinion. Will the prices of agricultural products become sufficiently remunerative?—that is the whole question. A slight upward movement has occurred as regards wheat on the principal markets, and it appears to be generally considered that the harvest in France will be nearly an average this year. The harvest is now proceeding in France. In fact so long since as June 24 some wheat arrived at Paris, which had been secured in the neighbourhood of Arles by M. Maifredy, who in 1861 carried off the prize of honour in the Boches-du-Rhône. This wheat was accompanied by a sack of flour obtained from the same source, and bread made from the crop of 1865 was probably eaten in France in June. This fact shows with what rapidity the products of harvests now spread themselves over France. If wheats will furnish nearly an average this year in France, oats appear generally compromised, and this will much increase the dearth of forage. At a recent sitting of the Central Agricultural Society of France, M. de Lavergne read a "note," which is calculated to inspire uneasiness, with reference to the enormous diminution of the sheep population of France. The statistics cited by M. de Lavergne are only brought down to 1857, but they are, nevertheless, of deep interest. The Government caused in 1857 a general census to be taken of the cattle existing in France; and when compared with a corresponding census made in 1852, the results indicated are not very satisfactory. As regards the bovine species, there was an augmentation, the number of cattle enumerated being 19,765,000 in 1857, as compared with 19,150,000 in 1852; but the bases adopted for the two censuses are not exactly the same, so that the comparison is not completely satisfactory. As regards pigs, there was an insignificant augmentation, and the number of horses and sheep declined. With respect to the sheep "population," the reductions assumed the proportions of a disaster, since it amounted to 20 per cent. Thus the number of sheep enumerated, which was 23,510,000 in 1852 fell in 1857 to 27,185,000, showing a reduction of 6,325,000. All the previous censuses

had indicated a progressive augmentation. Thus from 1829 to 1852 the number of sheep in France increased from 28,930,000 to 35,510,000, the total of 1857 having again fallen below that of 1829. The diminution occurred especially in ewes and lambs, as will be seen from the following short table:

Year.	Rams & Sheep.	Ewes & Lambs.
1852.....	9,600,000 .....	28,920,000
1857.....	9,475,000 .....	17,710,000
Diminution ...	225,000	6,110,000

The greatest loss was experienced in twenty departments belonging almost wholly to the centre of France:—

Departments.	1852.	1857.	Diminution.
Cher ... ..	807,163 ...	464,550 ...	842,613
Indre ... ..	929,458 ...	607,517 ...	321,941
Cantal ... ..	617,520 ...	341,263 ...	276,260
Haute-Garonne	407,009 ...	304,573 ...	192,436
Creuse ... ..	816,349 ...	627,364 ...	188,985
Côte-d'Or ...	573,235 ...	389,507 ...	183,778
Vienne ... ..	576,412 ...	392,822 ...	183,590
Eure-et-Loir ...	984,232 ...	815,440 ...	168,792
Haute-Vienne ...	741,404 ...	590,008 ...	151,401
Loir-et-Cher ...	538,931 ...	391,611 ...	147,320
Landes ... ..	677,075 ...	529,907 ...	147,168
Basses-Pyrénées	562,791 ...	417,247 ...	145,544
Nièvre ... ..	360,061 ...	217,353 ...	142,708
Drôme ... ..	387,132 ...	240,215 ...	137,907
Allier ... ..	483,952 ...	352,662 ...	130,290
Corse ... ..	367,710 ...	249,159 ...	118,551
Yonne ... ..	440,739 ...	324,802 ...	115,937
Aube ... ..	408,081 ...	392,832 ...	114,242
Aveyron ... ..	553,656 ...	741,961 ...	112,595
Loiret ... ..	526,867 ...	415,260 ...	111,607
Total ... ..	12,149,787	8,716,145	3,433,642

The loss in these departments was a third or a fourth of the flocks; in the sixty-seven others it was on an average one-sixth. The richest department of France, with respect to sheep, the Aisne, experienced only an insignificant diminution, the number enumerated in 1852 having been 1,052,000, and in 1857 968,000, showing a falling off of 84,000. These statistics only comprise evidence collected on the subject by veterinary surgeons. In 1853, M. Delafond presented a note to the Society on the disease which then devastated the flocks and more particularly those of the centre of France. "It is unfortunately too certain," said M. Delafond, "that in Champagne, the Nivernais, Burgundy, the Berri, Sologne, the Orléanais, and the Gatinais, the mortality is considerable. Several cultivators of the Cher have lost half or three-fourths of their flocks." M. Reynal also writes on the subject: "In 1853 and 1854 watery cachexy committed great ravages among sheep in France. The mortality attained a considerable total in the Brie, Champagne, the Sologne, the south-west; and as some writers estimate that in the Cher, the Gatinais, and in the Sologne proprietors have lost a fourth, a third, or three-fourths of their flocks. I think these totals exaggerated; if I judge by observations which I made myself in 1853 and 1854, the total mortality would amount to one-fifth. The flocks were then diminished not merely by the fact of the cachexy, but also by the sale of animals sacrificed under the influence of that disease. I also observed abortions among a great number of ewes. In 1854 and 1855, scab and foot-rot made also great ravages. On

the whole, I am convinced that epizootic diseases have materially contributed to the diminution which the ovine population of France has experienced. In 1857 the evils which prevailed had not been repaired, but we cannot throw any further light upon the subject at present by the aid of statistics. In 1862 a fresh census was taken, but with the dilatoriness which so

greatly mars the efforts of French statistics, the results have not yet been made public. When careful attention is paid to drainage, and when artificial forage and roots come in aid of pasturage in the feeding of flocks, diseases among sheep appear to have less violence, and the cultivator is less exposed to those enormous losses which may ruin him at one blow."

## CALENDAR OF AGRICULTURE.

This is the general harvest month in Britain, except in the extreme northern parts, where it is protracted into next month. Cut grain crops full ten days before dead ripeness is reached; the straw will be more juicy, and the flour will be whiter and more doughy. Wheat is best cut by hand-sickle or by reaping machine, tied into sheaves, set in shocks of 12 sheaves, and built into thatched ricks. Barley and oats are cut in the same way, or mown by scythe, and carried loose, or tied into sheaves some days after being mown. Peas are cut by hand-sickle, and laid into heaps. In fine weather spare neither expense nor pains in getting the crops cut and housed; employ plenty of hands, and allow an ample quantity of beer to the labourers. A sparing parsimonious harvest is the worst judged economy that can be imagined.

Clean thoroughly by scuffling and hoeing all drilled and green crops; earth-up potatoes, and pull by hand all tall weeds that may afterwards arise.

Lay lime and dung, with composts, on wheat fallows; both operations of dunging and liming

going on together, or the one following the other as near as possible; continue draining, the folding of sheep, and the soiling of cattle, as before directed.

Keep the lambs always in forward condition by grazing on the best pasture. The drafted flock of last year will now be ready for sale, and ewes may be put to the ram for early lambs.

Sow on well-prepared grounds in warm situations the seed of drum-headed cabbages, savoy, and broccoli, for plants to be used next spring. Sow rye and winter vetches for early spring use. Use dung for the vetches; or it may be better, in many situations, to rug-fallow the land, using dung at the same time, adopting every possible means of securing a crop of that most invaluable plant in the spring.

Burn ashes from every combustible material, and prepare constantly all kinds of artificial manures for the drill. Gather dung of all kind for composts, and vegetables to the manure pit. No person will ever do much in farming, who does not apply manures with a constant, or lavish and unsparing hand.

## CALENDAR OF GARDENING.

### KITCHEN GARDEN.

Sow in the first week the main crop of next year's early cabbage about London, and in its latitude from the 7th to the 10th; a week earlier for colder and more northern localities. Water the drills before sowing, if the weather be dry.

Winter spinach twice. Choose mellow soil, moderately rich, like that after fresh digged potatoes, the earliest. Nitrate of soda has been proved to be a most fertilizing dress, particularly in binding gritty loams, in half-a-pound scattered over a pole of 30½ square yards, digged in, and the rows a yard a part, sown as the digging proceeds.

Sow also a sprinkling of horn-carrot, turnips, the early Stone or Dutch salads, radish, and lettuce, early, and again after the second week. Cauliflower about the 21st day.

Dig up early potatoes; allow some of the medium-sized tubers of the ash-leaved kidney to lie exposed and "green," for seed store.

Transplant at various times, according to their size, stout, well-formed plants of cabbage, broccoli, savoy, and Brussels' sprouts.

Incorporate a quantity of good manure with the soil, to which has been added sulphate of ammonia in half-a-pound to the square pole. Coleworts for "greens," in the same manner, 12 inches apart. Celery, latest crop, before the 21st. In dry weather water liberally.

Never mutilate the plants by cutting the leaves.

Earth up former plantings timely and carefully. The spade may be used when the plants are strong, and have already been twice earthed. Propagate sweet herbs by slips and cuttings. Take up garlic, shallots, and onions that are ripe.

Destroy weeds, leave none to spread by seeding; and now the most careful attention is required.

Cut vegetable marrows and cucumbers as they come on, leaving none to become ripe. Be particular to gather French beans and runners; for if pods ripen, the bearing of eatable pods is immediately checked. "Gather beans, and have beans," says the old rule.

### FRUIT DEPARTMENT.

Raspberries, attend first to cut out the brown canes that have borne fruit, taking away slender and supernumerary young shoots; air and sun will thus act upon the six or seven good canes that are left to ripen. Burn the dry canes pruned out, and scatter the ashes over the raspberry beds, giving the earth back the inorganic salts thus developed by fire.

Spur-bearing trees, or espaliers may be regulated by cutting back the wandering brest or spurwood in one-third of its length. The sap is diverted to the lower buds, and in a few weeks the further cutting is done lower down, and reaches the base of amputation, which is thus beneficially delayed.

## AGRICULTURAL REPORTS.

## GENERAL AGRICULTURAL REPORT FOR JULY.

The weather having continued remarkably fine, the wheat crop in all parts of England has progressed rapidly. In the southern and western counties, some large patches of wheat have been cut, and partly carried in excellent condition, and, within a short period the sickle will be in general operation. The accounts respecting the yield of the new wheats vary considerably. Our impression is, that upon both light and heavy soils the return will be a full average one, especially in the northern and eastern districts. Naturally, therefore, millers have been very cautious in their operation for some time past, and the few samples of wheat on sale in the leading markets of consumption have been with difficulty disposed of at previous quotations. The large supply of wheat still in stack in various parts of the country, and the fine condition in which the samples have been on offer, have operated to some extent upon the trade. The importations from the continent are not likely to be very large, at current prices; but our impression is, that they will be sufficiently extensive to prevent any decided upward movement in the quotations, as the yield of the new wheats in most of the producing countries abroad, but more especially in America, is represented as quite equal to last year. The stock of English barley appears to be almost wholly exhausted. The few parcels brought forward have realised former terms; but foreign qualities have been a mere drug. The new crop is likely to turn out much larger than was anticipated. Oats, however, will, we apprehend, yield but a moderate return; whilst both beans and peas will, no doubt, prove short crops.

The fine rains have had a most beneficial effect upon the pastures, most of which are now full of grass. The first crop of hay has been mostly carried in fine order. In some districts it has proved about an average; in others somewhat deficient. The turnip, beet, and mangold crops are looking wonderfully well; indeed, it is stated that, owing to the scarcity of stock, great difficulty will be experienced in consuming them. We shall therefore have an abundant supply of food for winter use.

The value of hay has somewhat declined from the highest point: still, the quotations are very high. Old meadow hay has produced as much as £5 15s. per load.

The crop of apples has, we regret to learn, turned out almost a failure. Of pears and some other kinds of fruit, the growth is equal to last season. The deficiency in the apple crop will be severely felt in the cider districts.

Nearly the whole of our advices agree in stating that the potato crop is likely to turn out the largest and best ever known. Scarcely any traces of disease are to be met with in any quarter, and the markets are well supplied with new qualities, which are selling freely, at from 50s. to 130s. per ton. On the continent, the growth is expected to be very large.

The immense quantities of colonial wool disposed of at the last public sales have had a depressing influence upon the demand for English qualities, which have given way about 0½d. per lb. There are now on hand nearly 130,000 bales of wool for the next series, appointed to commence on the 17th of August. The strong prices still paid for all descriptions of cotton have, no doubt, prevented a further decline in the wool than we have here noted. The great firmness in the woollen trade, and the increased exports of goods, seem to confirm the

impression current in some quarters that English wool has seen its lowest range for some time.

The growth of hops in Kent, Sussex, Worcestershire, &c., promises to be very large. Most grounds are tolerably free from vermin, and very little mould has made its appearance in any quarter. Continental and American advices are equally favourable. As might be expected, very little business has been passing in any kinds, and the quotations have ruled almost nominal.

In Scotland, the grain trade has been in a most inactive state; prices, however, have been fairly supported. The crops almost generally are looking well. Potatoes promise an unusually large return.

The wheat trade in Ireland has been devoid of animation, at about stationary prices. All kinds of spring corn have moved off slowly, at barely the quotations current in the previous month. Potatoes are looking remarkably well.

## REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Notwithstanding that the imports of foreign stock have been on a very extensive scale, the actual numbers of beasts disposed of in the Metropolitan Cattle Market have been by no means large, the time of year considered. With the exception of the arrivals from Scotland the quality of the stock has been very middling. Prime beasts have therefore commanded a steady sale at very full prices to a slight advance, a few Scots and crosses having realised 5s. 6d. per 8 lbs., otherwise the beef trade has been in a sluggish state, on former terms. The "season" from Lincolnshire, Leicestershire, &c., has fully commenced, but as yet it has sent forward very few prime animals.

The numbers of sheep on offer have been only moderate, and nearly one-third of them have been composed of foreigners. Most breeds have appeared in but middling condition, and all superior sheep have sold freely at extreme quotations. The best Downs and half-breeds have found buyers at from 6s. 2d. to 6s. 4d. per 8 lbs.

The supplies of lambs have continued comparatively small, nevertheless the demand for them has been somewhat heavy at from 6s. to 7s. 4d. per 8 lbs.

The veal trade has been devoid of animation at from 4s. 2d. to 5s. 2d. per 8 lbs.

Pigs have sold tolerably well, with a steady inquiry. The quotations have ranged from 3s. 6d. to 4s. 10d. per 8 lbs.

The quality of the foreign stock disposed of has exhibited very little improvement. Some of the German sheep have arrived in improved condition, but the importations from Holland have scarcely equalled last year.

The large quantity of grass in the pastures and the splendid appearance of the root crops generally are calculated to have some influence upon the value of meat. Our impression is, however, that very high prices will prevail for several months.

The total supplies of stock exhibited in the Metropolitan Market were as follows:

Beasts	...	28,010 head.
Cows	...	580 "
Sheep and lambs	...	149,960 "
Calves	...	5,757 "
Pigs	...	2,480 "

## COMPARISON OF SUPPLIES.

	Beasts.	Cows.	Sheep and Lambs.	Calves.	Pigs.
1864	27,394	560	147,890	4,658	3,140
1863	24,070	525	169,870	3,822	2,682
1862	22,392	508	151,060	2,339	2,637
1861	19,740	560	156,140	3,532	3,240
1860	19,870	490	153,600	3,133	2,428
1859	19,600	476	166,632	3,609	2,430
1858	20,468	547	154,022	4,262	3,290
1857	19,558	530	142,280	3,830	2,395
1856	18,589	500	135,650	3,407	3,225
1855	16,702	535	140,470	2,747	4,000

The imports of foreign stock into London were as under :

Beasts .....	11,859 head.
Sheep .....	42,725
Lambs .....	12,431
Calves .....	4,237
Pigs .....	6,178

Total ..... 77,430

Same time in 1864 ... 47,046

" 1863 ... 51,553

" 1862 ... 38,272

" 1861 ... 37,262

" 1860 ... 44,658

" 1859 ... 30,347

" 1858 ... 31,192

" 1857 ... 26,968

" 1856 ... 30,637

" 1855 ... 22,642

" 1854 ... 22,242

" 1853 ... 38,795

The comparison of the arrivals of English, Scotch, and Irish beasts stands thus :—

	From	July, 1863.	1864.	1865.
Northern Counties ...	...	12,450	6,900	5,900
Norfolk, Suffolk, &c., ...	...	700	7,200	900
Other parts of England ...	...	4,700	2,300	2,320
Scotland ...	...	306	751	894
Ireland ...	...	470	280	200

## COMPARISON OF PRICES.

	July, 1862.			July, 1863.		
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Beef .....	3	0	4 10	3	4	5 0
Mutton ...	3	6	5 2	3	8	5 0
Lamb .....	5	0	6 4	5	4	6 4
Veal .....	4	0	5 0	3	8	4 4
Pork .....	3	10	4 10	3	6	4 6

	July, 1864.			July, 1865.		
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Beef .....	3	2	5 0	4	0	5 4
Mutton ...	3	6	5 4	4	4	6 4
Lamb .....	6	0	7 0	6	0	7 4
Veal .....	3	8	4 10	4	2	5 2
Pork .....	3	6	4 6	3	8	4 10

Only moderate supplies of meat have been on offer in Newgate and Leadenhall markets. On the whole the demand has ruled inactive, but at full prices. Beef from 3s. 6d. to 4s. 10d., mutton 4s. 4d. to 5s. 10d., lamb 5s. 6d. to 6s. 8d., veal 4s. to 5s., pork 3s. 8d. to 5s. 4d. per 8 lbs. by the carcase.

## ISLE OF ELY.

Holiday-making and politics must be our apology for the delay of our report beyond its proper time. During the last month we were suffering severely from the excessive drought and heat of the season. The pastures were bare and parched, and scarcely a vestige of vegetation was discernible, and consequently all kinds of live stock were pining, and it was with great difficulty that, by the aid of artificial food, they could be kept from losing flesh. The present month has wrought a marvellous change. We have had a succession of heavy-teeming showers, with gleaming sunshine and a high temperature. The consequence is, the pastures look more luxuriant and vigorous than they have looked at any time since the

middle of April, and mangolds, kohl rabi, and coleseeds are all growing rapidly, and we have the promise of an abundance of winter keeping, except hay, which is the worst crop we ever remember to have been gathered. But the causes which have operated so favourably in promoting the vigorous and rapid growth of our green crops have produced a directly opposite effect upon our wheat crops. The long continued dryness of the spring and early summer, with the occasional frosts we experienced, contributed to make the wheats very short in the straw, and we had the prospect of only a light crop, and regret to say this light crop is now suffering severely from mildew, occasioned by the change in the weather as already intimated. We therefore conclude that it can only by a perfect miracle be anything approaching an abundant crop; we fear it will be miserably deficient both in quantity and quality. Beans are short, but appear pretty well podded: peas are the same. Oats, on cool lands, in some instances are good, but generally the crop is deficient. Barley is a fair crop, and looks like yielding better than any other. Some of our forward wheats are just ready for the scythe. The sickle will be of no service this year, the crop being so short and so much storm-broken.—YOUR FEN REPORTER.—July 24th, 1865.

## LEICESTERSHIRE.

The glorious summer weather which has shone upon us for the last fortnight has forced the grain crops to ripeness, and the cutting of oats and barley has commenced. The continued dry season from the 2nd to the last day of June was very detrimental to vegetation, and grass for fodder fell very light to the scythe, and much below an average yield; but most of the hay was secured in excellent condition. The rainfall for June was 1.97 inches on three days, being about an average. In the present month up to this time have fallen 1.75 inches on 13 days, a great portion of which was the produce of thunder showers, being about three-quarters of an inch below an average. These showers have with the hot temperature been of great benefit to the corn crops, but not enough to have had any great effect upon the pastures. The prospect of the harvest at hand is very satisfactory, though on light soils the long drought in June has caused the corn to be short in the straw, and the bulk less than an average, yet the quality will be good if well harvested. The most failing crop is oats; it will be very deficient, probably a fourth below an average. Barley on cool and alluvial soils is generally good, and in many instances heavy, and laid by the late thunder showers; but the quality will be fine. The pulse crops have greatly benefited by the copious rain, and the bean pods will be better filled than at one time expected; still we cannot calculate upon their reaching an average yield—the same may be observed of peas. Of that important crop, wheat, we are able generally to give a favourable report, though they vary greatly. On the light sandy soils the effects of the drought in June are unpleasantly visible, and there we find a thin and stunted crop. On stronger and loamy soils a great contrast for the better is observable; nearly all are good, and some heavy and lodged by the late thunder showers, but these are the exception, as in most cases they stand up well, and will present no difficulty to the working of the reaping machines, which we expect to see more in action than in many past seasons. The calm fine weather at the time of wheat-flowering was greatly in favour of the ear filling well with a fine quality; and, as hot weather generally tends to this result, we expect the new crop will prove the truth of these remarks if well harvested. As to the yield in this county, we see no reason to doubt but it will reach an average. Harvest has commenced, and, if this fine, hot weather continues, it will become general next week with all kinds of grain, and in a short time much will be gathered in first-rate order; and we may calculate upon an early harvest and a quality of corn which will produce good flour, and that great blessing—excellent bread. We have much greater pleasure in reporting upon the root crop this season than for some years past. The showers fell shortly after the mangold and swede seed had been sown, and, with the land in fine order, the plants soon sprang up, and have continued to grow freely without any material check. We can safely assert that we scarcely ever knew the mangolds to show so fine and vigorous a plant so early in the season, which must yield a large amount of food for winter consumption. Both swedes and

common turnips have safely passed the most critical period of their young existence, and are growing rapidly; a few genial showers will be required soon to keep them progressing. We are glad to observe that potatoes are looking well, and we hear little of the disease: they will be a much more productive crop than last year. The prospect of an abundant supply of roots for winter consumption will cause the scanty crop of hay to be less felt than last year. Though the late rains have given the lattermaths a good start, yet they have not had so great effect upon the pastures as would have been the result of a more copious rainfall; and we hear great complaints of want of keep (even on first-rate feeding land), that the beasts have not thriven well, and are not ready for market so soon as could be desired; but the high price of beef and mutton will compensate for the loss in weight. Harvest coming upon us so suddenly, labour is in great demand, and high wages are obtained for job-work; and 15s. per week is about the average for day-work with beer or malt.—July 28.

#### SOUTH LINCOLNSHIRE.

We have lately had a superabundance of rain, which has caused some damage to the growing crops, particularly the heavy wheat crops. These are much laid, and show signs of mildew. In our last report, we remarked upon the many tight crops of the district; but, since we wrote, they have grown and thickened very much, so that, at the present time, a light crop is quite the exception. The ears of wheat are full, and well set; and even now, should "the weather take up," we have a good prospect for the ensuing harvest; but failing that, the laid wheats must be bad. The oat crops have astonishingly improved, and now bid fair to yield a full average crop. Barleys have also been greatly benefited by the copious rains, and are likely to yield well. The bean crop is too full and heavy; and many crops suffered from dried flowers at the time of blooming from over-heat: the sun was intensely hot one or two days at that critical time. Peas partook likewise of similar injury, but being a little forwarder in the blooming did not suffer so much, and will prove a more yielding crop than beans; moreover, the time for injury by aphides is past, so they may be considered safe. The bean crop, however, is by no means out of danger; indeed, only last year I had a field of 22 acres nearly destroyed by aphids after this stage in the crop. We have one of the most favourable seasons for the growth of our root crops ever known, consequently all is good. The mangold crop was never finer or more healthy-looking. Swedes are not quite so good and full, but still very promising; common varieties are progressing satisfactorily, so that we may anticipate a full supply of winter food for stock. The hay crops are light, but the major part of them are well got. Our grass pastures have recovered in a great measure from their bare and brown state, and now exhibit their beautiful green appearance, but the grass is too young and succulent for the safe progress of the stock. Up to this time stock of all kinds, where a supply of food was fair, have done well; prices are well supported. In this district the potato crop is of great importance. I am happy to say that notwithstanding our deluging rains and stormy winds, it is at present looking remarkably well. In this we greatly rejoice, because in the old days of "potato disease" this (rain and wind) was the very cause, and the very time of its commencement. I have carefully examined my own crops, extending over nearly sixty acres, some of which were planted early, and I do not observe a single symptom of disease. The wind has caused a plant here and there to exhibit the usual signs, but it is owing to the whipping of haulm only. It is unquestionably the best crop we have had for years. A thin or bad crop is scarcely to be found. Dalmahoy's will soon be ready to take up; flukes have not grown so freely as other sorts; regents look admirably; rocks are too luxuriant. All seed crops are very various. Rapeseed is an average crop, mustard below an average. Turnip seed is very bad—not half a crop. Mangold rather better. Our carrots are good. Onions fair.

#### AGRICULTURAL INTELLIGENCE, FAIRS, &c.

**BANBURY FORTNIGHTLY FAIR.**—Both in the cow and sheep markets the supplies were very short, and the at-

tendance also below the average. Beef 4s. to 5s., mutton 5s. to 6s. 4d. per 8lbs.

**BRIDGNORTH FAIR.**—There was a fair show of cattle, and the sheep penned were considerable. Good cows for the knife were sold at fully 7½d. to 7¾d. per lb.; and sheep (best wethers) realised 9d. fully; ewes about 8½d. per lb. Good lambs from 25s. to 30s. Stores, &c., went at the rate of the last fair in June.

**BRISTOL COLT MARKET.**—There was a first-class show of every description of horses. Some very good, handsome nags were offered for sale—not a very common occurrence at this market. Two-year-old cart colts were less plentiful than at last year's market: there was a good deal of inquiry after this class of animals, but buyers showed little disposition to pay the long prices that were asked for them; the sales, consequently, were rather sluggish. Mr. Cooper, who is well known for the fine young horses he brings here from Ireland, had a very fine lot of promising young horses at prices varying from £20 to £30. There was a good show of cart horses, and a brisk business seemed to be done in that class of horses.

**CHESHAM FAIR** was well supplied with lean beasts, cows, calves, &c., with some fat do.; demand moderate, all good animals finding buyers. Large steers and heifers made from £15 to £16, best cows from £19 to £22, calves from 20s. to 35s., fat beasts from 4s. 8d. to 5s. per stone. Best store tegs made from 34s. to 38s. each, ewes from 40s. to 45s., lambs from 26s. to 32s.; fat wethers from 5s. 8d. to 6s. per stone, ewes from 5s. to 5s. 4d., lambs at from 7s. to 7s. 4d. Pigs were of ready sale, lean stores making from 16s. to 25s. each; fat porkers from 6d. to 6½d. per lb.

**INVERNESS SHEEP AND WOOL FAIR.**—The Inverness market will not be soon forgotten in the glens. Never, we are quite confident, was there such a rattling sale for sheep of all ages; while the prices so readily offered, and as readily accepted, have, we believe, eclipsed the highest expectations of both parties. There can be no doubt as to the causes of this agreeable state of things; they are, first, the every-day increasing consumption of meat by the people; and, secondly, the vigorous efforts now being made so extensively to supply that consumption. On the other hand, it is said that in a great many cases the loss of breeding sheep has been so heavy of late years that farmers may be said to be pocketing a high dividend at the expense of capital. The extra price they are receiving for their produce at present should, according to sound farming, be devoted to restoring the stock on the hills to its full quality and efficiency. Wethers sold dear because mutton is in such demand; and ewes sold dear because everybody is turning more land to grass, and must breed stock for it. Nearly everything was sold on Friday night; and the evening trains for the north and east carried away very many farmers who had never before got through their marketing in double the time. For wool the demand has been almost at a standstill; but the prices current in all the markets north and south are very satisfactory, and we expect shortly to see a brisker state of trade, particularly in laid Cheviots. In most other varieties the prices are excellent, and the demand fair; and though, of course, an immense proportion of our Highland wool is "laid," it is not nearly so universally the rule as it used to be; and there are few farmers who have not already sold some white wool to their satisfaction at the sales of the past month. In estimating the difference in price between this year and last, consideration must be given in a great many instances to the question how the same stock were sold in 1864, and to its relative value this year. On an average, it may be said that lambs were sold at a rise of from 1s. to 1s. 6d. a-head; ewes at 2s. to 3s., and wethers from 2s. 6d. to 4s. above last year's prices. With regard to wool, so little was sold that no average quotation can be given, especially as in some cases in which clips were disposed of, buyers received an advantage in consideration of the too high price paid last year. The long looked-for rain of the past week has completely changed the prospects of the turnip crop, and to some extent restored the pastures already, so that the prospects for the winter are not so dismal in regard to sheep wintering as they promised to be. The grain crops, too, are very much refreshed, and, to an inexperienced eye, would pass for tolerable averages. The rain has been copious already; and St. Swithin, as we suppose, has declared for six more weeks of it; so harvest will not be likely to come on so soon, by at least a fortnight, as was expected.—*Inverness Courier.*



**OAKHAM FAIR.**—The attendance of buyers and farmers was large. The number of beasts and sheep on sale was rather under the average of July fairs. In fat beasts the show was seasonable, the trade for which was brisk, at 8s. 6d. to 9s. 6d. per stone. The trade in store beasts was lively, with prices against buyers. Of store and fat sheep rather a small number of each penned, the trade for which ruled active at full prices. Lamb trade brisk: second-class lambs from 27s. to 30s., smaller ones 21s. to 25s. each. Several lots were resold more than once at an advance.

**OVERTON FAIR.**—The following are about the prices realized for general stock: Lambs 25s. to 42s., ewes 36s. to 47s., two-teeth wethers 38s. to 50s. per head. The pens of rams and ram lambs, both of the Hampshire and Cotswold breeds were numerous, but contrary to what might have been expected under the very high prices ruling for all other sheep stock; the trade was slack, and to effect sales rather lower figures than usual had to be accepted. The fair ground seemed to be pretty well cleared by two o'clock, and on the whole prices may be considered about 2s. per head higher than last year, and over those obtained at the late Stockbridge fair.

**SEAMER FAIR.**—The show of lean cattle was very meagre, and buyers were backward in purchasing. Good English steers were scarce, and sold at £15 to £18; wyes £12 to £14 per head. Irish and Dutch cattle were much lower—even fifty per cent. per head; but sales were very slack. All fat stock sells readily at high prices. No good horses were shown, but plenty of moderate ones; and there was no briskness about it.

**SHREWSBURY FAIR.**—Trade for all descriptions of store stock quiet, with a downward tendency. Supply of prime beef not large, and prices as before. Beef 7½d. to 8d., mutton 8d. to 8½d., calves 7d., lambs 9d., pigs 6d. per lb. Good cows and calves dear. Ewes and lambs 42s. to 70s. per couple; wethers 42s. to 50s. a head.

**SPILSBY FAIR.**—The show of beasts was large. The best beef realized full 8s. 6d. per stone, with an upward tendency. Good stores, especially two-year-old steers and heifers, sold readily at full rates. In-calvers were much inquired for, but very few were on sale. Of cows in full profit, with calf by the side, there were only few in the fair, and they sold at large prices. The supply of sheep was smaller than usual: there was a ready trade at 7½d. to 8d. per lb. In the horse fair there was a show somewhat larger than usual. Good useful animals, whether for riding or driving purposes, were easily disposed of. Two or three large droves of ponies were on sale, in which very few sales were effected.

**ST. BOSWELL'S LAMB FAIR.**—The show of lambs was fully as large as last year, and there was a considerable improvement observable in the quality of the various lots. Business began shortly after dawn, and though it never approached anything like activity, the best lots went off steadily at high figures. Indeed, the prices obtained over the general market are unparalleled at St. Boswell's. Compared with last year, lambs would be up from 2s. to 3s. a head, or about ½d. per lb., and in some late cases, as much as from 4s. to 5s. was realized. This increase is no doubt to be attributed to the very heavy consumption of mutton, the high price of wool—which, though not so costly as last year, still forms an important element in the value of sheep—and to the excellent appearance of herbage on pasture lands. It may be interesting to state, as indicative of the great increase which has taken place in the value of the woolly tribe during the last few years, that, in 1854, the top lot at St. Boswells fetched 23s. 3d., while the top lot to-day realized no less than 39s., being a rise during eleven years of 15s. 9d. Hogs also sold dear, and it was reported that in value they were 2s. 6d. up from the same market last year. Three-part-bred lambs, which constituted the staple of the market, fetched from 30s. to 39s.; half-bred lambs from 24s. to 28s.; and hogs from 35s. to 42s. The market, generally speaking, was regarded as a stiff dear selling one, but at the close a fair clearance was effected.

**STOBBS FAIR.**—There was a large number of buyers present, and were willing to purchase, but in consequence of the very high prices asked, there was comparatively little business done, indeed many stated that they had not seen such a stiff market for many years. The prices of fat were from 10s. to 10s. 6d. per stone, or from about £17 to £25 a-head. Lean

realized from about 9s. to 9s. 6d., or from £10 to £16 a-head. There was only one lot of sheep on the ground, which were sold at 41s. a-head. Of milch cows there was a large supply, the prices realized ranging from £10 to £20. There was a large number of horses on the ground, but very few transactions took place. Harness horses brought from £20 to £30, and draught horses from £25 to £45. At the close of the fair a good many horses and cattle were turned off unsold.

**ST. SAIR'S FAIR.**—With the exception of a few lots, the greater part of the cattle shown were inferior animals. Prime fat brought 67s. 6d. per cwt., second quality 57s. 6d. to 63s. per cwt. Cattle in good condition met with a very ready sale, but in all other classes of stock trade was very dull. The number of sheep was above the average of the last few years. Trade stiff, with the exception of lambs, which brought very high prices. Mutton sold at 6½d. to 7½d. per lb., lamb 7d. to 8½d. Not much business done in wool, and only a small quantity exposed for sale; best English 3s. to 3s. 3d., black 3s. to 3s. 6d., blackfaced (Highland) 2s. per lb. of 24 oz. Demand for strong cart horses very brisk, and several very high prices were realized for animals of this class, the top figure being about £40; several sold at prices varying from £30 to £40. Half-bred carriage horses in request; several being sold at £40, and one as high as £45.

**TEWKESBURY FAIR.**—Beef and mutton scarce, the former made 8d. and the latter 8d. to 9d., while porket pigs realized about 7d.

**SCOTCH FAIRS.**—Stobbs' fair for the sale of horses and cattle was held at the fair muir, Dundee, on Tuesday. The supply of cattle—home, Irish, and foreign—was large, principally, however, of grazing descriptions. In consequence of the high prices asked, comparatively little business was done—indeed, so stiff a market has not been noted for many years. There was a large supply of milch cows, which sold at from £10 to £20 per head. A considerable number of horses were on the ground, but few transactions took place. Harness horses realized £20 to £50, and draught horses from £25 to £45. A good many lots of horses and cattle were turned off unsold. At St. Boswell's lamb fair there was a large attendance, and the show of lambs was fully as large as last year, while there was a considerable improvement observable in the quality of the lots. Business was not very active; nevertheless, the best lots went off steadily at high figures. Compared with last year, lambs were 2s. to 4s. per head higher, an advance attributable no doubt to the heavy consumption of mutton, the high price of wool, and the excellent appearance of herbage on pasture lands. While in 1854 the top lot at St. Boswell's made 23s. 3d., it this year realised 39s. per head, showing an advance of 15s. 9d. per head.

**IRISH FAIR.**—PORTLAW: The stock of cattle was not very numerous, and, with two or three exceptions, the cattle were sold before eleven o'clock, as the biddings were very animated. Good two-year-old heifers, forward on grass, averaged £13 to £15, yearlings £5 to £7 10s.; ewes averaged 30s. to 45s.; lambs 24s. to 27s.; weaned bonhams 19s. There were some horses, but not much bidding.

#### ENGLISH BUTTER MARKET.

**LONDON, MONDAY, July 24.**—We note a much slower trade in butter, very much owing to the emptiness of town.

Dorset, fine .....	118s. to 120s. per cwt.
Devon .....	112s. to 114s. per cwt.
Fresh .....	12s. to 14s. per dozen.

**CARMARTHEN BUTTER MARKET, (Saturday last).**—The market started at 11½d., and immediately got up to 11¼d., at which the whole was cleared off eagerly—all prime quality: secondary brands unmarketable. Many farmers hold back for 1s. per lb.

**GLASGOW CHEESE MARKET.**—Good supplies of cheese forward, which met a fair sale at former prices. 23 tons passed the weigh-house. Dunlop, old 63s. to 66s., new 53s. to 55s.; Cheddar-made, old 68s., new 59s. to 63s. 6d.; skim-milk 24s. to 26s. per cwt.

**SHREWSBURY CHEESE MARKET.**—Fat cheese 60s. to 67s., middling sorts 50s. to 60s., skim 30s. to 40s. per cwt. Bacon 8d. to 8½d., hams 9d. to 9½d. per lb.

## REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

Just as our last monthly review was published there came a fine fall of rain, allaying in part the previous apprehensions of drought; and July throughout has had a fair quantity in occasional storms and passing showers. Indeed, as the month came near its close, so much corn was laid, more especially wheat and barley, that fears of another kind arose, and the safe gathering of the crops became doubtful. But, with light breezes, the danger may be passed; and on the whole an immense amount of good has accrued from the timely fall. The thin wheat has had its ears better filled, and samples generally will be improved. Barley has filled up wonderfully, and is decidedly the best crop on the ground. The benefit to peas is more doubtful, as many are pulled and lying in the wet; but the bean crop, being the latest, gives much more promise. Oats, though improved where this grain was late, must, we still think, be very much below an average, many fields being scarcely over six inches high. Though some amendment in prices was noted last month, the favourable change has turned the scale against sellers, but some seem determined to see the harvest out before consenting to any reduction. Next in importance to the blooming time is that of gathering; and we hope there will be no lack of labour or perseverance as the time opens. Some quantity is already fit for cutting, more especially of barley, which we hope will be saved without sprouting or discoloration. Reaping machines now put a power into the hands of farmers which our ancestry never possessed; and if labour should fail they will be the agriculturist's "ultima." About the future price, when all depends, under Providence, on the weather, it is in vain to speculate; but with low rates to begin with, the certainty that old wheat will be wanted, and that no practical men look for more than an average crop, or even so much, there seems no reason for holders to be nervous. France is reported to be deficient; Russia in the same plight; Germany not over abundant; and the United States only doubtful: so it does not appear at present that heavy foreign imports are probable, especially when the attraction of good prices is wanting. The following rates were recently quoted at the several places named: At Paris the best wheat was worth about 43s.; at Antwerp, French and native red brought 45s. to 46s.; at Amsterdam, Polish was worth about 48s.; at Hambro', red marks about 43s. 6d.; at Stettin, 38s.; Dantzic quotations for the best new were 44s. to 45s., for prime old 49s. to 50s.; Ghirka wheat, from Taganrog and Odessa, has been selling for delivery, freight included, 38s. to 39s.; Wallachian, 34s.; at Montreal, Chicago spring wheat was quoted 32s. per 480lbs.; Upper Canada, to 34s. 3d. per qr. At New York the market has lately risen, with some export demand; and the

quotations for Chicago and Milwaukee spring were 31s. 6d. per qr., for amber Michigan 32s. 6d., and for winter red Western 35s. per 480lbs.

The first Monday in Mark-lane opened on improved English and good foreign supplies of wheat. The show also on the Essex and Kentish stands was fair for the time of year; and as a bountiful fall of rain had greatly improved the general prospects, the market was extremely dull, the only sales made consisting of picked qualities at the previous currency. The business in foreign was on the same restricted scale; but holders were indisposed to tempt buyers by making offers on reduced terms. Floating cargoes being also plentiful, prices were somewhat in favour of buyers. Though fine weather ruled through the week, the country advices were very little affected by the dull London reports: less business was, however, doing, and at some markets the tendency was downwards; but this was nearly balanced by more favourable accounts elsewhere.

On the second Monday much less English wheat was returned; but there was a large increase of foreign. But very few fresh samples were offered this morning on the Essex and Kentish stands; and this circumstance enabled factors to make a ready clearance on the full terms of the previous week. The foreign trade had not the same briskness; but prices were generally well maintained. Though floating cargoes were abundant, there was no reduction in prices. There was again very little difference noted in the country reports, the turn being, on the whole, more favourable to prices, some places being about 1s. per qr. dearer: among these were Birmingham, Hull, and Spalding. Liverpool was unaltered through the week.

On the third Monday there was a moderate English and liberal foreign supply, the quantity exhibited on the Kentish and Essex stands being fair. Some of the wheat was laid by the heavy rains, but not sufficiently so to stimulate prices, the crop on the whole being benefited. The trade was accordingly heavy, though factors generally stood out for the previous currency, at which a very limited business was transacted; while some, to clear, accepted 1s. per qr. less money. Almost nothing was passing in foreign qualities, the attendance being unusually thin. With but few floating cargoes on offer, prices were firm. The country advices this week were more generally dull; and in some places a decline of 1s. per qr. was submitted to, though occasionally showers were falling almost every day. The prices at Liverpool were somewhat easier through the week.

On the fourth Monday there was an improved English but diminished foreign supply. The show of samples from the near counties during the morning was scanty; but the country accounts noting more dulness, with an occasional decline,

notwithstanding the laying of many fields of wheat by the heavy rains, very little was sold, and that consisted of the best white Kentish at about the previous rates. More business could have been done had Essex factors consented to a decline of 1s.; but this they were unwilling to do, with the weather still doubtful. Almost nothing was passing in foreign qualities, which there was no disposition to press upon the market. Floating cargoes were but little in demand. The country markets through the week were either dull, or 1s. per qr. lower; and London declined on Friday 2s. per qr.

The imports into London for four weeks were 21,962 qrs. English, 73,399 qrs. foreign; against 19,221 qrs. English, 87,294 qrs. foreign for the same time in 1864. The quarter's imports ending July 1st were 68,124 qrs. English, 172,425 qrs. foreign; against 74,805 qrs. English, 143,762 qrs. foreign for the same time last year. The foreign imports into the kingdom for four weeks ending 15th July were 1,771,556 cwt. wheat, 236,826 cwt. flour. The general averages commenced at 41s. 3d., and closed at 43s. 1d.; and those of London began at 43s. 10d., and closed at 46s. No exports of wheat occurred during the month from the port of London.

The flour trade through the month has been very steady, but without activity. The country branch of business has been sadly complained of, for a long time, as wholly unremunerative; and millers have generally instructed their salesmen to hold at better prices, rather than continue a course of sacrifice. London bakers, however, are not prompt buyers; and both parties are nearly in a fix: 29s. is about the mean price of Norfolks, and the best qualities up to 33s. Since the arrival of a few barrels of American flour, holders have found it impossible to make sales at the recent figures, which were beyond a parity with other sorts; and we expect prices will give way perhaps 2s. per barrel. Other foreign have been dull; but town rates have kept at the old range, 40s. per sack being still the highest quotation. The imports into London for the four weeks were 56,580 sacks country, 1,746 sacks 6,347 barrels foreign; against 50,409 sacks country, 1,100 sacks 32,808 barrels foreign for the same period in 1864. The late falling-off in barrels, therefore, accounts for the high prices at which the small stock has been held.

The barley trade has been very quiet through the month, the quantity of English appearing at market being on the whole very small, and proving, after all the boasted greatness of the crop, that stocks are pretty well worked up. The business done has consisted therefore principally in foreign, for grinding, which has fluctuated in value about 6d. to 1s. per qr., closing dull, and leaving prices much as they were at the commencement of the month. The fact, however, that low barley at 50lbs. per bushel is only worth the same as oats at 40lbs. per bushel (say 21s. per qr.), almost shows that there is no prospect of much decline; while if the crops should be damaged by sprouting, there may be an upward movement. The imports into London for the four weeks were 485 qrs. British, 44,134 qrs. foreign; against 966 qrs. British, 10,489 qrs. foreign for the same period in 1864.

The malt trade, which at the commencement of the month was hardening for fine qualities, closed very quiet and dull.

The imports of foreign oats have doubled what they were in last June; and prices under such circumstances, notwithstanding the poor accounts of the crop, have gone back fully 1s. 6d. per qr., losing about half what has been gained. Good 40lbs. black swedes have been offering at 21s., and other qualities in proportion; but as the principal supplies have lately been from Russia, these sorts have most felt the decline, being previously too high-priced relatively. At the last market, however, more firmness was evinced for fine fresh corn, and we should not be at all surprised to see some reaction in favour of sellers. The imports into London in four weeks have been 1,164 qrs. English, 728 qrs. Scotch, 3,770 qrs. Irish, 246,148 qrs. foreign; against 1,789 qrs. English, 13,193 qrs. Scotch, 14,886 qrs. Irish, 186,162 qrs. foreign for July 1864.

But little has been passing in beans; prices all along have been firm, from the limited imports, and the certainty that but few can be expected. The early report, too, that the crop was very short and the pods few and badly filled, all helped to keep up rates; but the late rains have done them immense good. Fine small were worth 44s. to 45s., mazagan about 37s. to 38s. per qr. The imports into London for the four weeks were 1,009 qrs. English, 3,647 qrs. foreign; against 2,100 qrs. English last year, and no foreign. Prices being relatively high, there is less chance of improvement than otherwise.

But few peas have come to the London markets, either home-grown or foreign, and the business done has therefore been limited, with prices very firm, the only quantity in store to any amount consisting of white foreign—the best for boiling, the inferior for feeding. White peas being relatively low, we may see boilers set in at improved rates. The imports into London for the four weeks were only 306 qrs. English, 820 qrs. foreign; against 152 qrs. English, 4,203 qrs. foreign for July, 1864.

There has been a falling off in the linseed supply, but it has not affected values of either linseed or cake, both of which have been in steady demand, though for the latter it has lessened since the rain.

On the seed market business has been nearly at a stand. The small stocks and high prices of cloverseed quite prevented any speculation. Canary has remained dull, and mustard has undergone little change. The first samples of new rapeseed came fine, and made 84s. per qr.; but the market closed heavy, with only 78s. per qr. bid.

#### AVERAGES.

A Statement showing the Quantities Sold and Average Price of British Corn, Imperial measure, as received from the Inspectors and Officers of Excise, conformably to the Act of the 27th and 28th Victoria, cap. 87, in the week ended July 15, 1865:—

Wheat .....	80,046½ qrs.	43s. 1d.
Barley .....	1,198½ „	37s. 3d.
Oats .....	1,731½ „	32s. 6d.



## HAY MARKETS.

LONDON, SATURDAY, JULY 22.

SMITHFIELD.—Trade dull.

CUMBERLAND.—Demand inactive.

WHITEHAPEL.—A slow trade.

	Smithfield.	Cumberland.	Whitechapel.
MEADOW HAY, old	s. d. s. d.	s. d. s. d.	s. d. s. d.
	90 0 to 130 0	90 0 to 135 0	90 0 to 130 0
New	100 0 to 110 0	100 0 to 115 0	100 0 to 110 0
Clover, old	100 0 to 150 0	100 0 to 180 0	110 0 to 150 0
New	100 0 to 120 0	100 0 to 150 0	100 0 to 150 0
STRAW	25 0 to 35 0	30 0 to 36 0	25 0 to 35 0

BIRMINGHAM, MONDAY, July 17.—Hay, old £4 15s. to £7, new £4 to £6 per ton. Straw, 3s. 4d. to 3s. 6d. per cwt. Clover, &c., 19s. to £1 per ton.

MANCHESTER, WEDNESDAY, July 19.—Hay, old 6½d. to 8d., new 5½d. to 6½d.; Straw, wheat 5½d. to 5½d., oat 6½d. to 5½d. per stone.

WORCESTER, WEDNESDAY, July 26.—Hay, new £4 10s. to £4 15s., old £5 to £5 10s.; Straw, £2 5s. to £2 10s. per ton.

## TIMBER.

BAL TIC FIR TIMBER.				CHRISTIAN & SANDERSON'S			
Per load 50 cubic feet.				s. d. s. d.			
Riga	65 0 to 70 0			Second do.	9 0 to 10 0		
Dantzig and Memel	75 0 to 85 0			Dram & Frederick-	9 0 to 9 10		
Crown	75 0 to 85 0			stead's battens, do.	7 0 to 8 10		
Best middling	57 0 to 75 0			Gothenb'g, gd stocks	10 0 to 11 0		
Good middling	50 0 to 60 0			Common	9 0 to 9 10		
second	50 0 to 60 0			Gele and Swedish	9 15 to 11 0		
Common middling	55 0 to 65 0			Swedish deals and			
Small, short, and	45 0 to 55 0			battens, long mill-			
irregular	50 0 to 60 0			sawn	9 10 to 11 0		
Stettin	50 0 to 60 0			Dantzig, or w'nd deck,			
Swedish	50 0 to 60 0			per 60 feet 5-inch	1 0 to 1 5		
Small	45 0 to 55 0			Brack	0 15 to 0 18		
Swedish & Norway	40 0 to 45 0						
balks	40 0 to 45 0						

AMERICAN PITCH PINE.  
United States 0 0 to 0 0

BAL TIC OAK TIMBER.  
Memel, crown 110 0 to 130 0  
Brack 90 0 to 100 0  
Dantzig and Stettin,  
Crown 80 0 to 120 0  
Brack & unequal'd 60 0 to 70 0

WAINSCOT.  
Per log 18 cubic feet.  
Riga, crown 50 0 to 105 0  
Brack 65 0 to 70 0  
Memel and Dantzig,  
Crown 75 0 to 85 0  
Brack 55 0 to 65 0

DEALS AND BATTENS.  
Per Petersburg standard burred.  
Arohangel & Onega 12 10 to 14 10  
Seconds 10 0 to 10 10  
Petersburg 11 10 to 13 0  
Wyburg 9 10 to 10 0  
Finland and hand-  
sawn Swedish 7 10 to 8 10  
Petersburg & Riga  
white deals 9 5 to 10 5  
Memel and Dantzig,  
Crown red deals 12 10 to 14 0  
Brack 9 0 to 11 0

OAK STAVES.  
Per mille pipe.  
Memel, crown 180 0 to 210 0  
Dantzig, Stettin &  
Hambro full-size'd 150 0 to 155 0  
Canada, stand. pipe 60 0 to 65 0  
Furnace, 1,500  
pieces 16 0 to 17 0  
Boznia, single brl.,  
1,200 pieces 26 0 to 30 0  
United States, pipe  
Hoghead, heavy  
and extra 23 0 to 26 0  
Slight 16 0 to 17 0

LATHWOOD.  
Per cubic fathom.  
Petersburg 9 10 to 10 10  
Riga, Dantzig, Memel,  
and Swedish 6 15 to 8 0

FIREWOOD.  
Per cubic fathom.  
Swedish, red deal  
ends 4 10 to 4 15  
Norway, red & white  
boards 3 15 to 4 5  
Rounds and slabs 3 15 to 3 5

BARK, &c.  
English, per load of  
45 cwt. delivered in  
London 16 10 to 17 10  
Coppice 16 10 to 18 0  
Dutch, per ton 5 0 to 6 0  
Hambro 5 0 to 6 0  
Antwerp Tree 5 0 to 7 0  
Do. Coppice 6 10 to 7 10  
French 0 0 to 0 0  
Mimosa Chopped 10 0 to 11 10  
Do. Ground 11 10 to 13 0  
Do. Long 8 0 to 10 0

Cork Tree, Barbary 5 0 to 6 10  
Do. Sardinian 5 10 to 6 10  
Valonia, Smyrna 17 0 to 20 0  
Do. Camata 17 0 to 20 0  
Do. Morea 13 0 to 17 10  
Terra Japonica 21 5 to 23 0  
Gambier in bales 37 0 to 38 0  
Ditto free cubes 34 0 to 35 10  
Cutch 20 0 to 21 10  
Divi Divi 10 0 to 13 10  
Myrabolams 12 0 to 14 10  
Sumach, Slody, p. cwt. 10s. to 17s. 6d.

PITCH.  
British, per cwt. 20 5 to 20 0  
Arohangel 16 9 to 16 0  
Stockholm 13 6 to 13 0

TURPENTINE.  
French 23 6 to 24 0  
American 3 0 to 3 0  
Bough 0 11 to 0 12 0

TAR.  
American 20 0 to 20 0  
Arohangel 15 0 to 15 0  
Stockholm 15 6 to 15 0

WHALEBONE.  
Greenland, full size  
ton 2400 0 to 2500 0  
South Sea 400 0 to 450 0

RESIN.  
French 20 12 to 21 0  
American 1 12 to 1 0

## HIDE AND SKIN MARKETS.

MARKET HIDES.	s. d.	s. d.	Horse hides, each	s. d.	s. d.
56 to 64lbs.	0 3 1/2 to 0 5		Calf skins, light	2 0 to 2 10	
64 to 72lbs.	0 3 to 0 3 1/2		Full	2 0 to 2 10	
72 to 80lbs.	0 3 to 0 3 1/2		Polled sheep	0 6 to 0 8	
80 to 88lbs.	0 3 1/2 to 0 4		Half breeds	0 6 to 0 8	
88 to 96lbs.	0 3 1/2 to 0 4		Down	0 6 to 0 8	
96 to 104lbs.	0 0 to 0 0		Shearings	2 2 to 2 11	
104 to 112lbs.	0 0 to 0 0		Lambs	2 0 to 2 5	

## MANURES.

PRICE CURRENT OF GUANO, &amp;c.

Peruvian Guano, direct from the importers' stores, or ex ship (30 tons)  
£12 5s. to £12 10s. per ton.  
Bones, £8 10s. per ton.  
Animal Charcoal (£70 per cent. Phosphate) £5 per ton.  
Coprolite, Cambridge, whole £3 5s. to £3 8s., ground £3 12s. to £3 15s.  
Suffolk, whole £1 12s. to £2, ground £2 10s. to £2 12s. per ton.  
Muriate of Potash, £15 to £14 per ton.  
Nitrate of Soda, £15 to £15 10s. per ton.  
Sulphate of Ammonia, £14 to £15 per ton.  
Gypsum, 30s. per ton. Superphosphate of Lime, £8 to £8 5s. per ton.  
Sulphuric Acid, concentrated 1 845 id. per lb., brown 1 712 3/4 id.  
Brimstone, 50lbs. to 27 lbs. per ton. Dissolved Bones, £6 15s. p. ton.  
Lined Cakes, best American barrel, £11 5s., ditto bag £10 10s. p. ton.  
English, £11 to £11 10s. Rape Cakes, £5 12s. to £6 per ton.

E. PURSER, London Manure Company,  
116, Fenchurch Street, E.C.

Guano, Peruvian £12 7 6 to £20 0 0 Lined Cakes, per ton—  
Do. Upper do. 5 15 0 to 6 0 0 Americ., thin bgs. £3 0 0 to £3 10 0  
Kooria Moorla 0 0 0 to 0 0 0 Do. in bria 0 0 0 to 0 0 0  
Boone Ash 0 0 0 to 0 0 0 English 10 0 0 to 10 10 0  
Brimstone, 50lbs. to 27 lbs. per ton. Dissolved Bones, £6 15s. p. ton.  
Salt-petre, Bengal, 0 0 0 to 0 0 0 Lined Bomby p. q. 2 17 2 to 2 17 4  
3 per cent. 0 0 0 to 0 0 0 Rapeseed, Guzerat 2 0 0 to 2 0 0  
Nit. of Soda, p. ct. 0 12 6 to 0 12 6 Niger 2 0 0 to 2 0 0  
Gloverseed, Amer. 0 0 0 to 0 0 0 Tallow, 1st F.Y.C. 2 3 0 to 2 3 0  
red, new per cwt. 0 0 0 to 0 0 0 super. Northis 1 10 0 to 1 10 0

SAMUEL DOWNES AND CO., General Brokers,  
Exchange Court, Liverpool.

Agricultural Chemical Works, Stowmarket, Suffol.  
Prentice's Cereal Manure for Corn Crops 10 0 0 to 12 0 0  
Mangold Manure 10 0 0 to 12 0 0  
Prentice's Turnip Manure 10 0 0 to 12 0 0  
Prentice's Superphosphate of Lime 10 0 0 to 12 0 0

## WOOL MARKETS.

ENGLISH WOOL MARKET.

LONDON, MONDAY, July 24.—We have again to report a very inactive demand for most kinds of English wool, at the late decline in value. The transactions on Continental account are very limited, owing chiefly to the large supplies of colonial wool—110,000 bales—on hand for the next public sales, which will be commenced on the 17th proximo.

CURRENT PRICES OF ENGLISH WOOL.	s. d.	s. d.
FLEECES—Southdown hoggets	per lb.	1 8 to 1 8 1/2
Half-bred ditto	"	2 0 to 2 2
Kent fleeces	"	1 11 to 2 0
Southdown ewes and wethers	"	1 8 1/2 to 1 9
Leicester ditto	"	1 10 1/2 to 2 0
Sorts—Clothing	"	1 6 to 1 11
Combing	"	1 5 to 2 4

BRADFORD WOOL MARKET, (Thursday last).—The remarkable spurt in the Liverpool cotton market on Monday gave a more animated appearance to our market, and led to a decided improvement in business; but as this market is always a reflex in some measure of the cotton market, the depression in cotton since Monday has been felt here, and to-day the improvement of the last market day seems to have almost disappeared. Sales to-day are far from numerous, but there is great confidence among holders, and prices are quite firm at last Thursday's quotations, with a slightly hardening tendency.—Bradford Observer.

DONCASTER WOOL MARKET, (Saturday last).—About 150 sheets shown to-day, being a similar quantity to last week. It sold rather slowly, at last week's prices, and the average of Lincolnshire (one-third hog parcels) was 69s. per tod.

DORCHESTER WOOL FAIR.—During the whole of the morning the trade was exceedingly slack, and very little went to the scale, but as the day advanced the wool growers yielded, and were met in a corresponding spirit by the wool staplers, and the result was that all, or nearly all, the wool pitched (consisting of about 1,500 tods) was sold. The prices realized were, for half-bred ewes 49s. to 51s., tegs 51s. to 53s., down ewes and tegs 46s. to 48s.

YORK WOOL MARKET, (Thursday last).—In addition to 430 sheets of wool left unsold last week, we had 115 fresh

ones, making a total of 542 sheets on offer, not above 100 of which were sold. Being election-time, we may call it quite a holiday-market, very few buyers being present, and no disposition shown for business by either buyers or sellers. The little done was at prices in favour of buyers, as is always the case at such markets. Under such circumstances it is very difficult to give quotations of prices.—*Yorkshire Gazette*.

#### LIVERPOOL WOOL MARKET.—July 22.

SCOTCH.—The attention of the trade has been entirely taken up with the wool fairs in the north, where prices have ruled considerably under last year's rates. In the meantime, in the absence of business here, the quotations may be considered nominal.

	s.	d.	s.	d.
Laid Highland Wool per 24lbs.....	18	0	to 19	0
White Highland do.....	22	0	26	0
Laid Cheviot do. unwashed	24	0	28	0
Do. washed ...	28	0	32	0
White Cheviot do. washed ...	44	0	50	0

FOREIGN.—Our market has been very quiet during the week, both on account of the general elections and the proximity of our public sales here next week, which deter buyers from entering into transactions by private contract of any extent, the quantity of East Indian Wool to be offered next week is about 14,000 bales, and the sales of sundry foreign wools will commence on the 8th Aug.

BRECHIN WOOL MARKET.—The chief lots sold consisted of whitefaced washed, which sold at 1s. 11d. to 2s. 1½d. per lb.; blackfaced hoggs, washed, 1s. 1d. to 1s. 2d., unwashed 9d. to 10d.

GLASGOW WOOL MARKET, (Saturday last).—During the week the wool market here has been quiet, and the demand has not been so good as for some time past. The Highland fairs occurring during the week, and the attention given to the elections throughout the country, have contributed to cause less inquiry in this market for wools. Prices are well maintained, and lots are being taken off for immediate consumption. Great caution, however, is evinced by the buyers, and they are purchasing mostly for immediate wants.—F. H. M'LEOD.

DUBLIN WOOL MARKET, (Thursday last).—Wool has shown some life again, and prices have hardened for deep combing sorts fully ¼d. a lb. Short wool, especially the mountain kind, has not recovered the late depression, but still suffers under foreign competition, and the bad name of pitch, tar, and lead brands prohibiting its use, which, if not immediately remedied, will render it unsaleable. Two shillings for long hoggs and 1s. 1½d. for half hoggs have been refused to-day. Twenty pence is the maximum for mountain, and large quantities have been exchanging hands at 1s. 6d. to 1s. 7d. per lb. Scotch horny wool, 1s. to 1s. 3d.; down wool, 1s. 9d. to 1s. 10d.

### METALS.

#### ENGLISH IRON.

Bars, &c., British.....	27	15	0	to	28	5	0
Nailrods.....	8	10	0		9	5	0
Hoops.....	9	10	0		10	5	0
Sheets.....	9	10	0		10	10	0
Pig, No. 1, in Wales.....	3	0	0		4	0	0
Bars.....	7	5	0		7	10	0
Rails.....	7	0	0		7	5	0
Pig, No. 1, Clyde.....	2	14	0		3	15	0

#### FOREIGN IRON.

Swedish.....	12	10	0		0	0	0
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#### FOREIGN STEEL.

Swedish bog.....	14	15	0		15	0	0
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#### ZINC.

In sheets.....	24	10	0		0	0	0
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#### SPELTER.

On the spot.....	22	0	0		23	5	0
To arrive.....	22	10	0		0	0	0

#### ENGLISH COPPER.

Tie.....	85	0	0		85	0	0
Tough Casts.....	85	0	0		85	0	0
Sheets and Bolts.....	91	0	0		92	0	0
Sheet.....	91	0	0		92	0	0
Bottoms.....	96	0	0		0	0	0
Yellow Metal.....	0	0	7½		0	0	8½

#### ENGLISH LEAD.

Pig, per ton.....	19	0	0		19	10	0
Sheet.....	20	10	0		0	0	0

#### FOREIGN LEAD.

Spanish, in bond, per ton.....	18	10	0		0	0	0
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#### ENGLISH TIN.

Block, per ton.....	94	0	0		0	0	0
Bar.....	95	0	0		0	0	0

#### FOREIGN TIN.

Banca.....	95	10	0		0	0	0
Straits (market).....	95	0	0		0	0	0

### AGRICULTURAL MEETINGS IN 1865.

JULY 31, AUGUST 1, 2, and 3.—Highland and Agricultural Society of Scotland.—Meeting at Inverness. Entries closed. President, the Duke of Argyll, K.T. Secretary, Mr. J. Hall Maxwell, 6, Albany-place, Edinburgh.

AUGUST 2, 3, and 4.—Yorkshire Agricultural Society.—Meeting at Doncaster. Entries closed. President, the Duke of Devonshire. Secretary, Mr. Thomas Parrington, Normanby, Middlesborough.

AUGUST 7.—Tyne-side Agricultural Society.—Meeting at Hexham. Entries close August 2. President, the Rev. Dixon Brown. Secretary, Mr. Christopher Stephenson, Four Stones, Hexham.

AUGUST 8.—Durham County Agricultural Society.—Meeting at Durham. Secretary, Mr. F. T. Wharam, North-road, Durham.

AUGUST 8.—Badminton Farmers Club.—Meeting at Badminton. Entries closed. Secretary, Mr. Richard W. Lloyd, Badminton.

AUGUST 8.—North Londale Agricultural Society.—Meeting at Ulverston. President, the Duke of Devonshire. Secretaries, Messrs. J. P. and T. Postlethwaite, Ulverston.

AUGUST 9 and 10.—Royal North Lancashire Agricultural Society.—Meeting at Accrington. Entries closed. President, Jonathan Peel, Esq. Secretary, Mr. George Hunt, 20, Chapel Walks, Preston.

AUGUST 10.—Northumberland Agricultural Society.—Meeting at Morpeth. Secretary, Mr. Walter Johnson, Trench Hall, Gateshead.

AUGUST 23.—Whitworth and Rochdale Agricultural Society.—Meeting at Rochdale. Entries close August 7. President, Albert H. Royds, Esq. Secretary, Mr. Robert Tweedale, Broadley Vale, Rochdale.

AUGUST 23.—County Kildare Agricultural Society.—Meeting at Naas. Entries close August 12. President, The Marquis of Downshire. Secretary, Mr. R. W. Bagot, Fontstown, Kildare.

AUGUST 24.—Burnley Agricultural Society.—Meeting at Burnley. Entries close August 11. President, Colonel Towneley. Secretaries, Mr. Robert Whittam and Mr. George Storey, Burnley.

AUGUST 26.—Halifax and Calder Vale Agricultural Society.—Meeting at Halifax. Entries close August 12. President, Lieut. Col. Edwards, M.P. Secretary, Mr. William Irvine, Holmfild, Halifax.

AUGUST 29, 30, and 31.—Manchester and Liverpool Agricultural Society.—Meeting at Oldham. Entries close August 1. President, the Hon. Algernon Egerton, M.P. Secretary, T. B. Ryder, 57 A, Church-street, Liverpool.

AUGUST 30.—Lytham and Kirkham Agricultural Society.—Meeting at Kirkham. President, T. L. Birley, Esq. Secretary, Mr. Joseph Parkinson, Queen-street, Lytham.

AUGUST 30.—Whitby Agricultural Society.—Meeting at Whitby. Entries close August 16. President, H. S. Thompson, Esq., M.P. Secretary, Mr. James Wilkinson, Whitby.

SEPTEMBER 1.—Kelghley Agricultural Society.—Meeting at Kelghley. Entries close August 23. President, William Laycock, Esq. Secretary, Mr. R. Fawcett, Low-street, Kelghley.

SEPTEMBER 6 and 7.—Sparkenhoe Farmers' Club.—Meeting at Loughborough. Entries close August 7. President, C. W. Packe, Esq., M.P. Secretary, Mr. Thomas Davenport, Ashby-de-la-Zouch.

SEPTEMBER 12.—Waterford Farming and Agricultural Society.—Meeting at Waterford. Entries close September 6. President, the Marquis of Waterford. Secretary, Mr. Robert S. Blee, Bean-street, Waterford.

SEPTEMBER 12.—Bicester Agricultural and Horticultural Association.—At Bicester. Secretary, Mr. W. E. Hitchman, Bicester.

SEPTEMBER 12 and 13.—Warwickshire Agricultural Society.—Meeting at Stratford-on-Avon. Entries close August 1. President, the Earl of Warwick. Secretary, Mr. John Moore, Northgate-street, Warwick.

SEPTEMBER 14.—Market Drayton Agricultural Society.—Meeting at Market Drayton. Entries close September 2. President, H. B. Corbet, Esq. Secretary, Mr. W. D. Green, Market Drayton.

SEPTEMBER 14.—Thame Agricultural Association.—Meeting at Thame. President, Herbert Wykeham, Esq. Secretary, Mr. George King, Thame, Oxon.

SEPTEMBER 18.—Ludlow Agricultural Society.—Meeting at Ludlow. Entries close September 4. President, Benjamin Giles, Esq. Secretary, Mr. Thomas Weyman, Ludlow, Salop.

SEPTEMBER 20.—Brecknock Agricultural Society.—Meeting at Brecon. Entries close September 9th. President, Lord Viscount Hereford. Secretary, Mr. Richard Hall, High-street, Brecon.

SEPTEMBER 20.—Carmarthenshire Agricultural Society.—Meeting at Carmarthen. Entries close September 9. President, Morgan Jones, Esq. Secretary, Mr. D. Prosser, Carmarthen.

**SEPTEMBER 30.**—Royal and Central Bucks Agricultural Society.—Meeting at Aylesbury. Entries close August 30. President, The Hon. Benjamin Disraeli, M.P. Secretary, Mr. G. Fell, Aylesbury.

**SEPTEMBER 30.**—Wirral Agricultural and Horticultural Society.—Meeting at Birkenhead. Secretary, Mr. Wm. Henderson, Birkenhead.

**SEPTEMBER 25.**—Over Agricultural Society.—Meeting at Over. Entries close September 11. President, Col. Cholmondeley. Secretary, Mr. Thomas Rigby, Darnall Farm, Over.

**SEPTEMBER 28.**—Wellingborough Agricultural Society.—Meeting at Wellingborough. President, G. W. Hunt, Esq., M.P. Secretary, Mr. J. W. Sharman, Wellingborough.

**SEPTEMBER 26.**—Glamorganshire Agricultural Society.—Meeting at Cowbridge. Entries close September 19. President, Lord Tredegar. Secretary, Mr. Edward Bradley, Cowbridge.

**SEPTEMBER 27.**—Huntingdonshire Agricultural Society.—Meeting at Huntingdon. Entries close September 19. President, the Earl of Sandwich. Secretary, Mr. James Dille, Market-place, Huntingdon.

**SEPTEMBER 28.**—West Cumberland Agricultural Society.—Meeting at Whitehaven. Entries close September 21. President, Captain Fisher. Secretary, Mr. Robert Jefferson, Preston Hows, Whitehaven.

**SEPTEMBER 28.**—Derbyshire Agricultural Society.—Meeting at Derby. Entries close August 18. President, the Duke of Devonshire. Secretary, Dr. Hitchman, Mickleover, Derby.

**SEPTEMBER 28.**—Okeahire Agricultural Society.—Meeting at Congleton. Entries close September 14. President, Randle Wilbraham, Esq. Secretary, Mr. Richard T. Beckett, Oulton Farm, Tarporley.

**SEPTEMBER 30.**—Ballinasloe District Agricultural Society.—Meeting at Ballinasloe. Entries close September 23. President, the Earl of Clancarty. Secretaries, Mr. Charles Filgate and Mr. H. I. Gascoyne, Ballinasloe.

**SEPTEMBER.**—Staffordshire Agricultural Society.—Meeting at Lichfield. Entries close August 24. President, the Earl of Lichfield. Secretary, Mr. W. Tomkinson, Newcastle, Staffordshire.

**SEPTEMBER.**—West Cumberland Agricultural Society.—Secretary, Mr. Robert Jefferson, Preston Hows, Whitehaven.

**OCTOBER 4.**—Tring Agricultural Society.—Meeting at Tring. Entries close September 1. President, F. J. Moore, Esq. Secretary, Mr. William Brown, Tring.

**OCTOBER 6.**—Denbighshire and Flintshire Agricultural Society.—Meeting at Ruthin. Entries close September 19. President, Lord Bagot. Secretary, Mr. William Gregg, Tyn Twle, Mold.

**OCTOBER 6.**—Norton Agricultural Society.—Meeting at Norton. Entries close September 20. President, The Rev. F. Silver. Secretary, Mr. F. Silver, Norton-in-Hales, Market Drayton, Salop.

**OCTOBER 8.**—Sleaford Agricultural Society.—Meeting at Sleaford. Entries close September 23. President, A. Willson, Esq. Secretary, Mr. Joseph Bellamy, Sleaford.

**OCTOBER 11.**—Monmouth Agricultural Society.—Meeting at Monmouth. Entries close September 30. President, John E. W. Rolls, Esq. Secretary, Mr. Henry Dyke, Monmouth.

**OCTOBER 11.**—Long Sutton Agricultural Society.—Meeting at Long Sutton. Entries close September 30. President, William Skelton, Esq. Secretaries, Messrs. John Clarke and John Swain, Long Sutton, Lincolnshire.

**OCTOBER 17 and 18.**—Herefordshire Agricultural Society.—Meeting at Hereford. Entries close September 18. President, Sir J. E. Bailey, Bart. Secretary, Mr. J. O. Fowler, St. John's-street, Hereford.

**OCTOBER.**—Ayrshire Agricultural Society.—Autumn Meeting at Kilmarnock. President, the Marquis of Ailesa, K.T. Secretaries, Messrs. J. and J. MacMurtrie, County Buildings, Ayr, N.B.

**NOVEMBER.**—Framlingham Farmers' Club.—Meeting at Framlingham. Entries close November 1. President, F. S. Corrance, Esq. Secretary, Mr. W. B. Kent, Earl Soham, Wickham Market.

**NOVEMBER 8.**—Faversham Agricultural Society.—Meeting at Faversham. Entries close October 28. President, Lord Sondes. Secretary, Mr. James Tassell, Faversham.

**NOVEMBER 23.**—Blandford Farmers' Club.—Meeting at Blandford. Entries close November 6. President, John Hoffs Mitchell, Esq. Secretary, Mr. James Domoney, Orchard-street, Blandford.

**NOVEMBER 23.**—Rutland Agricultural Society.—Meeting at Oakham. Entries close for Stock and Poultry November 13. President, G. H. Finch, Esq. Secretary, Mr. John Sleath, Braunston, near Oakham.

**NOVEMBER 23 and 24.**—Chippenhams Agricultural Association.—Meeting at Chippenhams. Entries close November 17. President, Sir John Neale, Bart. Secretary, Mr. Edward Little, Lanhill, Chippenhams.

**NOVEMBER 24.**—Rugby and Dunchurch Cattle Show, & Rugby. Entries close October 31. President, the Earl of Dalkeith. Secretary, Mr. Edmund Harris, Rugby.

**NOVEMBER 25, 27, 28, 29, and 30.**—Birmingham and Midland Counties Fat Stock and Poultry Show, at Bingley Hall, Birmingham. Entries close November 1. President, the Earl of Harrowby. Secretary, Mr. J. B. Lyall, 13, Temple-street, Birmingham.

**NOVEMBER 27.**—Abingdon Fat Stock Show, at Abingdon.—President, Charles P. Duffield, Esq. Secretary, Mr. Charles L. Cox, Oak-street, Abingdon.

**NOVEMBER 28, 30, and DECEMBER 1.**—Yorkshire Fat Stock Show, at York. Entries close November 8. President, Lord Londesborough. Secretary, Mr. John Watson, Sandal Bridge, York.

**DECEMBER 4, 5, 6, 7, and 8.**—Smithfield Club Fat Cattle Show, at the Agricultural Hall, Islington. Entries close for Implements, October 2; for Stock, November 1. President, Mr. John Spencer, E.G. Secretaries, Messrs. Brandreth Gibbs and David Pullen, Half-Moon-street, Piccadilly.

**DECEMBER 6, 7, and 8.**—Northern Counties Fat Stock and Poultry Show, at Darlington. Entries close November 13. President, The Duke of Cleveland. Secretary, Mr. John Hodgson, Paradise House, Darlington.

**DECEMBER 7.**—Dorking Fat Stock Show, at Dorking. Entries close November 23. Secretary, Mr. Edward Butcher, High-street, Dorking.

**DECEMBER 12.**—Tredegar Agricultural Society.—Meeting at Newport, Monmouthshire. Entries close November 15. President, Lord Tredegar. Secretary, Mr. J. G. Pulling, Newport, Monmouthshire.

**DECEMBER 12.**—Melkham Agricultural Society.—Meeting at Melkham. Entries close December 5. President, E. L. Lopez, Esq. Secretary, Mr. P. Phelps, Melkham.

**DECEMBER 12.**—Guildford Agricultural Society.—Meeting at Guildford. President, Capt. A. H. Sumner. Secretary, Mr. Richard B. Baker, St. Martha, Guildford.

**DECEMBER 12, 13, 14, and 15.**—Leeds Smithfield Club Show, at Leeds. Entries close November 16. President, J. D. Luccock, Esq., Mayor of Leeds. Secretary, Mr. John Swales, Hunslet-road, Leeds.

**DECEMBER 14.**—Rye Fat and Lean Cattle, Poultry, and Root Show, at the Stock Market-place, Rye. Entries close December 7. President, Moses Body, Esq. Secretary, Mr. H. E. Patne, Rye.

On the *first Monday* in every month from February up to May, and recommending in November, there is a Discussion Meeting of the Farmers' Club, at 3, Robert-street, Adelphi, at half-past five o'clock. On the *first Wednesday* in every month—excepting January, September, and October—there is a Council Meeting, confined to Members of Council and Governors of the Royal Agricultural Society, in Hanover-square, at twelve o'clock; and on *other Wednesdays*, from February to July, an open Meeting for all Members of the Society, at twelve o'clock.







*Engraved by W. H. Webb from a Photograph*

*Edward Herndon*

*London Published by Rogers & Partridge 154 Strand 1861*

## PLATE V.

### PORTRAIT OF SIR EDWARD KERRISON., BART., M.P.

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#### SIR EDWARD KERRISON, BART., M.P.,

THE LATE PRESIDENT OF THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

Sir Edward Kerrison ranks very worthily with such men as Mr. Handley and Mr. Pusey, who at long intervals have been selected from the lower House to fill the office of President of the Royal Agricultural Society. Whether proved by the performance of his several duties in the Council Chamber, on the show-ground, or yet more practically by his business about home, Sir Edward has earned some deserved distinction as an agriculturist. His name stands upon most of the Committees in Hanover-square, and he has taken an especial interest in the education question; at the great national meetings, as well as in the Eastern Counties, his herds of highly-bred shorthorns and polled milch-cows have pretty generally their place on the prize list, while Sir Edward has also cultivated the breed of Suffolk cart-horses with proportionate success. The Hall farm and home-stead are thus well stocked with the best sorts of the district; nor has the care of the man been forgotten about Scole, for Lady Caroline Kerrison has designed and published a series of plans for labourers' cottages, which, it is understood, have been carried out on her husband's estates. To go a step further, we may say that Sir Edward has the innate taste of a country gentleman for rural sports, has a quick eye for a clever cob, and during the season may be seen twisting his team from Piccadilly into the Park, if not joining the

procession of the Four-in-hand Club on a pilgrimage to Greenwich or Richmond. Although he gives his strong support to a smart pack of harriers, Sir Edward is not himself much of a hunting man, but he is better with the trigger, and, in fact, rather a heavy game-preserver in Suffolk, and a good man on the hill in Ross-shire.

Sir Edward Kerrison's election to the post of President was a very popular one, and he has discharged the requirements of the office with every credit to himself. At Plymouth, indeed, he rode the lines day after day, followed by a servant on a high-stepping hack, with indefatigable industry, and at one time on the Wednesday had a narrow escape from being received by the West Country folks as the Prince himself.

Sir Edward Clarence Kerrison, the second baronet, was born in 1821, and succeeded his father, General Sir Edward Kerrison, in 1853. He finished his education at Oxford, and married in 1844 the Lady Caroline Margaret Fox Strangeways, daughter of the Earl of Ilchester. Sir Edward, who holds to Conservative principles, has represented Eye since 1852, and was returned at the recent election without opposition. He is a deputy-lieutenant of Suffolk, a lieutenant in the Suffolk Borders Yeomanry, and a captain of the 10th Suffolk Rifle Volunteers, a corps that owes much of its efficiency to the active interest which the Captain takes in its conduct.

Sir Edward Kerrison's character may be best gathered from the following inscription on a picture, by Richmond, which is hung in the Corn Hall at Eye:—

"This portrait of Sir Edward Clarence Kerrison, Baronet, M.P., was painted at the request of 465 subscribers, consisting of the tenantry and residents of the borough of Eye and neighbourhood, in testimony of the high esteem in which he is held as a landlord and country gentleman and neighbour, and by their desire is placed in this Corn Exchange, to the erection of which he has so liberally contributed. A.D. 1857."

Sir Edward was mainly instrumental in founding this Hall; while he has also established a reformatory at Thorndon for boys convicted of crime, has built twice over a flax factory at Eye, and done a deal for the new Middle-Class College, at Framlingham, adding the munificent gift of £2,000 to his original subscription of £500, in order that the school might start fair and free from debt.

We are indebted to a correspondent for the following curious tradition associated with the family property of the Kerrisons: "The extensive estates of Oakley Park and Brome Hall, in the county of Suffolk, are situated chiefly in the parishes of Hoxne, Thorne, Oakley, Denham, and

Eye, in a finely wooded and highly cultivated district. The manor of Oakley Park was erected, about forty years since, by the late baronet, from designs by Smithe, and is in the Grecian style a noble banquetting hall occupies the centre of the building, and is supported on handsome pillars of red granite. It is eighty-four feet long, lighted from the ceiling by dome lights. The statuary and other works of art are very valuable. This spot is the more interesting to all who take an interest in the history of England's kings, as the mansion is traditionally said to stand on the spot where King Edmund was first traced, when martyred by the Danes, and tied to an oak tree near the Old Abbey Farmhouse. The fall of this tree, only a few years since, in a still June night, was supposed to have been caused by the great weight of the night dew on the foliage. The tree was of that great age that the wood had lost all its strength, so that, instead of showing any clear rift, according to the run of the grain, it broke into all sorts of shapes; and, as if to verify the universally-believed tradition that it is the same tree where the martyrdom was committed, a large triangular piece of the oak fell out, in which is imbedded an ancient iron arrow's head. This is carefully preserved, and has afforded much interesting conjecture and discussion amongst antiquarians."

## PLATE VI.

### TO HOWDEN.

Here is a chance for a judge to pick up a good one—not in all the crowd and bustle of the fair, or rather of the day before, for the best business at Howden is over before the fair begins—but after a quiet look over the grey as he comes in from The Grange. He is four off, by Chanticleer, and saw hounds a few times last season. Poor "Nimrod," in his famous book on *The Condition of Hunters*, tells a story, somewhat against himself, of how when he took to farming in Hampshire he drew a couple of hundred pounds to go and buy bullocks at Basingstoke. On his way, however, he met the dealer's man, with a wonderfully clever grey horse in

hand, and of course they naturally pulled up to have a word or two over so promising a nag. In quite as much a matter of course, "Nimrod" got his leg over him, and it ended by the two hundred going in a lump for the horse, instead of to its original purpose of buying beasts. Still, if we remember rightly, the moral was all the best way, for the grey turned out a clipper, and doubled the outlay very shortly afterwards.

Howden and Horncastle are the two great horse-fairs of the country, and the very names of these two towns are as suggestive of such dealings as Mark Lane is for corn or Hereford for cattle.

## THE MINERAL PHOSPHATE OF LIME.

BY CUTHBERT W. JOHNSON, F.R.S.

There is considerable reason to believe that the mineral phosphate of lime has not yet been employed, as a fertilizer, so extensively as its merits deserve. This remark applies, we think, not only to its soluble but to its insoluble state. Two prize essays on this important question are inserted in the present volume of the Highland Society's Transactions. The enquiry is not one of recent date. It was in 1848 that Professor Daubeny and Captain Wid-

ington made a voyage into Spain to examine the native phosphate of lime of Estremadura (*Jour. Roy. Ag. Soc.*, vol. v., p. 406). They found the phosphorite rock existing in large masses, a short distance from Logroson, a considerable village, about seven Spanish leagues to the south-east of Truxillo. It there forms "a rock varying from 7 to 16 feet in breadth, traceable for nearly two miles, and extending into the earth to a great, though as



F. T. L. 1863

F. T. L. 1863

*St. James's  
St. James's*

*Engraved by R. Groom, & Published by S. W. Street, 1863*



yet an unascertained, depth." Some specimens analyzed by these usefully-employed voyagers consisted, per cent., of—

Silica	1.70
Peroxide of iron	8.15
Fluoride of calcium (fluor spar)	14.00
Phosphate of lime	81.15

They brought with them to England a sufficient supply of the phosphorite for various trials. Some of these experiments were made by Dr. Daubeny, on turnips, with the following results (*ibid*, vol. vi., p. 330):

	Roots. lbs.	Tops. lbs.
Soil simple produced per acre	14,288	30,591
Manured with 10 cwt. of bone shavings per acre	19,239	35,210
Spanish phosphorite alone, 12 cwt.	28,639	42,018
Spanish phosphorite, 12 cwt., mixed with sulphuric acid	30,869	34,476
South American Guano, 280 lbs.	31,114	47,080
Bones, with sulphuric acid, 11 cwt.	31,898	17,600
Bones, finely powdered, 12 cwt.	36,185	45,448
Stable dung, 22 tons	39,476	49,912

One conclusion to which these experiments tended is, as Dr. Daubeny well remarks, that "as the Spanish phosphorite, which appears to act so beneficially, is wholly destitute of organic matter, it seems to follow that the more valuable portion at least of what is applied to the land, when bones are scattered over it, is the phosphate of lime, and not, as some have supposed, the oil or gelatine."

The useful result to which the Professor was thus led was supported by the experiments of Sir Harry Verney on the use of the phosphorite as a manure. The soil to which he applied it was a heavy sandy loam, resting on a clayey subsoil: the ground was sown with mangel wurzel in 1844, whose seeds, through the extreme drought of the summer, did not vegetate sufficiently for any satisfactory conclusion. In April, 1845, the ground was sown with Chevalier barley, with the following result (*ibid*, vol. vi., p. 333):—

	Manure per acre.			Produce.		
	Tons.	Cwts.	Qrs.	Qrs.	Bush.	Pks.
Soil simple	0	0	0	5	6	2
Barot bones	0	18	0	5	8	2
Laburat bones	1	7	0	5	0	0
Pigeons' dung	0	18	0	7	5	0
Spanish phosphorite and sulphuric acid	0	18	0	6	3	2
Spanish phosphorite alone	0	18	0	5	3	2
Superphosphate of lime	1	5	3	5	6	3
Stable-yard dung	20	0	0	8	2	0

Other experiments on the same important question were made by Mr. J. B. Lawes, at Rothamsted, in Hertfordshire (*ibid*, vol. viii., p. 510). He found, in some trials upon the growth of turnips, in 1844, with various manures, that the following was the weight of the turnip bulbs per acre:—

	Tons.	Cwts.
Soil simple	5	4
Soil dressed with 8 cwt. of ground apatite, or native phosphate of lime	8	1
8 cwt. of apatite, decomposed by sulphuric acid, containing 200 lbs. of apatite	6	15
37½ lbs. of apatite, decomposed by sulphuric acid, containing 104 lbs. sulphuric acid and 370 lbs. apatite	7	8
5 cwt. of superphosphate of lime	7	14
5 cwt. of superphosphate of lime—the land dug six inches deep	8	15

These trials, then, entirely accord with the experience of others on the native phosphate of lime. All these, in fact, support the conclusion which Dr. Daubeny adopted after numerous trials with the native phosphate of lime of Spanish Estremadura (*ibid*, vol. vi., p. 329), that, whilst in

every instance a considerable increase of crop was obtained by the addition of certain fertilizers, the Spanish phosphate, especially when its action was quickened by the addition of sulphuric acid, proved nearly as efficacious as bones themselves, unless, indeed, when the latter were very finely powdered.

In 1855 another series of trials with swede turnips were reported by Professor Voelcker (*ibid*, vol. xvi., p. 92). In these trials the ground coprolites employed were found to contain per cent.—

Hygroscopic water	1.20
Water of combination, and a trace of organic matter	3.20
Oxides of iron and alumina	4.94
Lime	39.81
Magnesia	5.68
Phosphoric acid	33.45
Carbonic acid	5.39
Insoluble siliceous matter	12.66
Alkalies, sulphuric acid, and loss	8.41
	100.00

The result of these trials, as the Professor remarked, showed very considerable differences in the weight of the bulbs raised by an equal money-value of different manures. Thus whilst £3 worth of home-made superphosphate of lime gave an increase of 8 tons 8 cwt. 16 lbs. per acre, £3 worth of "economical" manure produced merely 16 cwt. 16 lbs. more per acre than the unmanured portion of the field. Again, it will be observed, that whilst £2 worth of dried night-soil gave only 9 tons 4 cwt. of roots, a mixture of guano and dissolved coprolites gave 12 tons 16 cwt. 16 lbs., and dissolved coprolites alone 11 tons 12 cwt.

These differences are still more strikingly exhibited in the following table, in which the different plots are arranged according to the increase which the various fertilizers employed upon each produced; the table likewise shows the cost at which 1 ton of increase was produced in each experimental trial.

Table showing Increase per Acre, and Cost of 1 ton of Increase, in 10 experimental trials upon Swedes.

	Increase per acre.		Cost of 1 ton of increase.	
	tons.	cwts. lbs.	£	s. d.
Home-made superphosphate	8	8 16	0	4 9
Dissolved coprolites and guano	7	13 16	0	5 3½
Guano	6	8 58	0	6 2½
Dissolved coprolites	6	8 0	0	6 3
Mixture of guano, soot, dissolved coprolites, and bone super-phosphate	4	16 8	0	8 3½
Nut-refuse	4	16 0	0	8 4
Commercial night-soil	4	0 0	0	10 0
Bone-dust	3	12 0	0	11 1½
"Economical" manure	9	16 16	3	9 6½
Nothing				

(Produce of the unmanured soil per acre, 5 tons 4 cwt.)

These trials were with the mineral phosphate of lime dissolved in sulphuric acid. Other trials have been made with the mineral phosphate alone, finely pulverized. Such were those carried on at Glasnevin, in Ireland, by Mr. Baldwin, in the season of 1859-60.

In the Glasnevin trials (*Agri. Gaz.*, 1861, p. 487) the farmyard manure was applied at the rate of 30 tons per statute acre—the artificial dressings at the uniform cost of £8 per acre. The Peruvian guano cost £18 5s., the ground bones £8, the finely-ground coprolites £4 per ton. The produce of swede turnips per acre from the land thus manured was as follows:

From farmyard manure	18 tons 15 cwt.
Peruvian guano	13 10
Dissolved coprolites	14 10
Ground bones	10 10
Dissolved bones	11 5
Ground coprolites	14 5



In the valuable series of trials lately marked by the approval of the Highland Society, the mineral phosphate was tried both in its simple state and when previously dissolved in sulphuric acid. The experiments of Mr. R. J. Thomson, of Kilmarnock, were upon yellow turnips. The whole field was manured with 25 tons of farmyard manure per acre, and so much of each artificial manure was added as to contain 150lbs. of phosphate of lime per acre. The produce, on two series of trials of turnips, in tons and cwt. was as follows (*Trans. High. Soc.*, 1865, p. 496).

	Section 1.	Section 2.
Soil simple	16 18	13 16
Ground coprolites	16 14	14 18
Dissolved coprolites	19 13	17 11
Bone-ash	16 14	16 8
Bone-ash dissolved	19 18	17 5
Bone-ash and gypsum	18 4	17 10
Ground bones	18 10	18 2
Ground bones dissolved	19 5	18 10
Bolivian guano	18 16	17 8
Sulphuric acid	16 12	17 11
Gypsum	15 4	17 3

The quantity of sulphuric acid and gypsum applied was made equal to that in the dissolved bone-ash.

The results per acre, reported in the prize essay of Mr. S. D. Shirreff, of Saltcoats, in East Lothian, were as follows. These experiments on swedes were made in the season of 1863-64 (*ibid.*, p. 501).

	Produce.
	Tons. Cwt.
4 cwt. of bone superphosphate	21 16
4 cwt. Peruvian guano	20 8
4 cwt. of coprolite phosphate	21 13
4 cwt. of Peruvian guano	21 13
4 cwt. of dissolved phosphatic guano	21 13
4 cwt. of Peruvian guano	21 13

The next trials were with the white globe turnip :

	Produce.
	Tons. Cwt.
6 cwt. of dissolved bone-ash	21 12
2 cwt. of nitrate of soda	21 10
6 cwt. of dissolved coprolites	21 10
2 cwt. of nitrate of soda	21 17
6 cwt. of bone-ash	21 17
2 cwt. of nitrate of soda	21 17

The mineral phosphates commonly employed at present by the artificial manure makers are either the coprolites of the Suffolk crag, or those from the lower chalk of Cambridgeshire, or the native phosphate of lime of Norway. These have been carefully analyzed and described by Professor Voelcker (*ibid.*, vol. xxi., p. 350). He remarks, first, of the Suffolk coprolites (pseudo or false coprolites) : "These phosphoric deposits occur in the more recent tertiary strata, as a layer varying from three to eighteen inches in thickness, between the coralline crag and London clay. The Suffolk crag is exceedingly rich in fossils, consisting partly of the fractured and rolled bones of cetaceous and other animals, with some fish-teeth, and chiefly of rolled water-worn pebbles, which were formerly supposed to be the fossilized excrements of saurian and other animals, for which reason they were called coprolites.

"Professor Buckland, however, showed that they are not true fossil excrements, but in all probability calcareous pebbles which have undergone a peculiar metamorphosis, and become impregnated with phosphoric acid by long-continued contact with decaying animal and vegetable substances.

"The name pseudo or false coprolites, which Professor Buckland proposed for them, has been generally accepted by the scientific world. In commercial phraseology, we have to understand by Suffolk-coprolites, or crag-coprolites, or pseudo-coprolites, the mixed fossil-bones,

fish-teeth, and phosphatic pebbles which occur in the Suffolk Crag.

"These phosphatic matters are distinguished from the grey-coloured chalk-coprolites by a brownish, ferruginous colour, and smoother appearance. They are very hard, and yield, on grinding, a yellowish-red powder.

The subjoined analysis represents their average composition—

Moisture and water of combination with a trace of	2.53
organic matter	38.30
Lime	1.34
Magnesia	24.24
*Phosphoric acid	4.51
Oxide of iron	3.72
Alumina	5.37
†Carbonic acid	1.40
Sulphuric acid	.56
Potash	1.15
Soda	.97
Chlorine	4.31
Fluorine and loss	12.27
Insoluble siliceous matter	100.00

\* Equal to tribasic phosphate of lime (bone-earth) . 52.52  
† Equal to carbonate of lime . 12.20

The following is the result of an analysis of an average sample of Cambridgeshire coprolites :—

Moisture and organic matter	4.63
Lime	43.21
Magnesia	1.12
Oxide of iron	2.46
Alumina	1.36
*Phosphoric acid	25.29
†Carbonic acid	6.66
Sulphuric acid	.76
Chloride of sodium	.09
Potash	.32
Soda	.50
Insoluble siliceous matter	8.64
Fluorine and loss	4.96
	100.00

\* Equal to tribasic phosphate of lime (bone-earth) 54.89  
† Equal to carbonate of lime . 15.13

The native phosphate of lime, or apatite, as the Professor remarks, is a hard and often well-crystallized mineral, chiefly composed of phosphoric acid and lime. It is found in this country in Devonshire, Cornwall, and Scotland, but not as yet in sufficient quantity to allow of its being collected for technical purposes. In America it is found imbedded in granite at Baltimore, in gneiss at Germantown, in mica-slate in West Greenland, in granite in Connecticut; and in granite, in Maine, and in various other localities. On the Continent it is found in several places, as in the Tyrol, Bohemia, Bavaria, Sweden, and Norway. Most commonly it occurs in thin seams, imbedded in crystalline or volcanic rocks, but seldom in sufficient quantity to repay the cost of working.

Mineralogists distinguish several varieties of apatite. Generally speaking apatite has a light green or a reddish colour. The apatite which at present is imported into England from Norway is found chiefly at Krageroe.

A specimen of red-coloured apatite furnished, on analysis, the following results :—

Hygroscopic water	43
Water of combination	40
*Phosphoric acid	41.88
Lime	53.45
†Chloride of calcium	1.61
Phosphate of iron and alumina	.66
Insoluble siliceous matter	1.24
	99.67

\* Equal to tribasic phosphate of lime (bone-earth) 80.74  
† Containing chlorine . 1.03

This specimen had a bright red colour like ironstone, and yet it contained but very little oxide of iron. Another sample of very light green-coloured, almost white, apatite from Krageroe, contained—

Hygroscopic water	...	...	...	...	19
Water of combination	...	...	...	...	23
*Phosphoric acid	...	...	...	...	41.25
Lime	...	...	...	...	50.62
†Chloride of calcium	...	...	...	...	6.41
Oxide of iron	...	...	...	...	29
Alumina	...	...	...	...	38
Potash	...	...	...	...	04
Soda	...	...	...	...	13
Insoluble siliceous matter	...	...	...	...	82
					100.36
* Equal to tribasic phosphate of lime (bone-earth)					89.39
† Containing chlorine	...	...	...	...	4.09

These valuable researches on the use of the mineral phosphate of lime ought to lead us to other and more varied experiments. The natural fertility of those soils in which the mineral phosphate of lime abounds would rather lead to the conclusion that, even in its apparently insoluble state, this salt is available by the growing plant, in some way which at present we are not able to clearly understand. Professor Way long since described some of those soils, which are dispersed over our island (*Jour. Roy. Ag. Soc.*, vol. ix, p. 56); and, indeed, where the tourist sees the farmers of Suffolk spreading the shelly crag (which contains this salt) in such copious dressings over their light barley-lands, and the farmers of the counties of Devon and Cornwall, in far larger quantities, employing as a manure their similarly-composed sand, such a tourist can hardly avoid the conclusion that the phosphate of lime in these dressings must constitute, in some mode or other, a considerable portion of their value.

## A FEW WORDS UPON THE POTATO DISEASE.

BY A PRACTICAL FARMER.

I deeply regret that we have many unmistakable manifestations of the return of the potato-disease. For the past two years we have been wholly free from it in the neighbourhood from whence I write, but this year it appears to commence with more than ordinary rapidity and virulence. On Tuesday last, August 15th, I was examining a field of mine of twenty-four acres, an excellent crop, and all looking well. On Wednesday we had much vivid lightning, tremendous thunder-claps, followed by heavy rain. To-day, August 18th, there is scarcely a healthy plant of regents to be seen. Of flukes the appearance is much better. The haulm is only just showing symptoms of attack. On the further side of the field stands a plot of a new variety of "red regents," scarcely affected at all; and adjoining are three acres of Dalmahys, which are partially touched. In another field of twelve acres, a short distance off, are planted about eight acres of rocks, one acre of regents, one acre of flukes, one acre of "red regents," and one acre of Skerry blues. The rocks have all gone, or nearly so; the regents still tolerably free; the flukes only just showing a few decaying leaves; the red regents are nearly free; but the Skerry blues do not show any signs of decay whatever. I would observe that I am speaking of the haulm only in these remarks. The tubers in any case have not yet suffered much damage; but my neighbour, who is an extensive grower, finds many already in his fields, and to the extent of four and five at a root. In another field of mine of nine acres, lying at some distance from the above fields, I have five acres of Renfrewshire regents, two acres of Dunbar regents, both direct from Scotland; and two plots of rocks and Dalmahys respectively. The rocks are by far the most decayed in this field, and the Dalmahys look best. The regents are about equally decaying, but there are diversities in two or three instances, owing chiefly to the varieties of manures, and management applied, which at a future day I wish to recur to. At present the milder manures cause the better appearance in the crop, and have done so throughout their growth. The manures applied have been pond mud over the surface; then a dressing of fold-yard dung in ridges; next a liberal sowing of a mixture of pond mud, ditch roadings, and fold-yard manure, mixed, and decomposed by a strong admixture of lime and salt; and lastly, to this was added, in the first part of the field, 3½ cwt. of *Lawes' superphosphate* per acre, on the

next portion 8½ cwt. of best *Peruvian guano* per acre, and on the last portion 8½ cwt. of *Birmingham blood manure* (highly popular here). *Lawes'* superphosphate from the commencement took a decided lead, and has held it up to the present time, and the haulm is more healthy looking. The Peruvian guano has, up to near this time, been the lowest on the scale of progress; but since these rains have put in, it has pushed the haulm into stronger growth, as both haulm and leaf denote; but this part of the field shows more disease than either of the other parts. The other manure has proved well, but certainly it does not equal the superphosphate; and should the crop of tubers also prove advantageous to the superphosphate, it would suffice to show that, in this case at least, an expenditure in artificial manure in superphosphate to the amount of £1 3s. 11d. per acre is equal to the expenditure of £2 7s. 10d. in Peruvian guano; or it tends to prove that this particular soil is deficient in phosphates. Be that as it may, this is the state and progress of the crop under the varieties of manure, the soil itself being a mild loam of medium character. When I raise the crop I shall endeavour to ascertain the difference in tubers. But I am digressing from my intention in writing this paper. It was chiefly to suggest immediate action in stemming the disease. There are several ways of modifying these attacks. The first I would point out is to take a pair of strong horses and good moulding-plough, and mould up the crop as closely and effectually as possible, so as to prevent excessive moisture operating, or atmospheric influences to abet it. The next course to this, and perhaps a better one, is to cut off or draw up the haulm so that none is left, and then to mould up the ridge again so that no moisture or droughts can enter the ridge. This course, however, prevents the further development of the crop. Another, and the easiest course, is simply to cut off the haulm, and with it to carefully cover the ridges; but this is not effectual. In the other cases it is truly serviceable, but still not fully effective. Another course is to press the haulm aside, so that the dews and rains should deposit their moisture between the ridges; but this is a very defective way. The winds soon disturb and raise it up again "all manner of ways." Another plan is to take up the crop. This is also a bad practice. It is to no purpose to lift the crop till it is ripe and ready, as the good tubers will then soon rot. If the



skins will abide a tolerably hard rub they may do, but not otherwise; and at present this cannot be the case in a general crop. No one knows what ought to be done. The most prudent and wisest course is to wait with all patience the result of the attack. A course of fine weather will effect far more than all the skill and contrivance of cultivators. The prospect is by no means a bright one as respects the crop, but when the haulm is removed there is almost a full stop put upon its growth. It is better to wait awhile than to do this; but the exclusion of air and moisture from the tubers cannot fail to be right. Unquestionably it would be both safe and wise to lift the potato crop as soon as it ceases to grow, and the tubers denote maturity. The slight depth of covering in the ridge does not suffice as an effective protection from rain or disease. Every effort must be made to save this valuable crop, for it is not at all unlikely to be our main dependence in the ensuing winter. Meat is already selling at ninespence per pound. In face of this we have the Russian Rinderpest and a deficient harvest. Food must be dear. It may yet be imperatively necessary for the Government to forbid importations of stock, and the losses already sustained are very seriously affecting the

community. The Rinderpest is daily spreading, and removals of stock are perilous. The country is on the alert, having at last become aroused to the consequences of this tremendous evil. The idea of mutual protection or mutual insurance is all right enough, but it won't stay the infliction. There cannot be a doubt but that every animal travelling from the interior of Russia, passing through various climates, much unpropitious weather, and without sufficient food, is just in a state to take any infection, or spontaneously to imbibe one. Some regulation in this particular ought to be enforced. If the shippers cannot prove that due and satisfactory care has been taken of the stock shipped from their first stage of transit up to their landing stage, they ought not to be permitted to land. It may be hard upon exporters or importers, but no unhealthy or unduly emaciated stock should be permitted to land on our shores. A knowledge of this would soon put these classes of men upon their guard, and it would be found that but few Russian or any other stock from the interior of the continent would find their way to this country. I trust every stockowner will, if for his own sake merely, do his best to prevent the increase of this fatal disease.

## IS IT A FALLACY TO FEED CATTLE AND SHEEP ON MALT?

DEAR SIR,—“Feeding cattle on malt is a fallacy.” These are Mr. Gladstone's words in his budget speech for the present year. Is it a fallacy to feed cattle on malt, may I ask? for this is a question important and interesting not only to the scientific man and the practical grazier, but to every flesh-eating individual in the country: to men with large families and scanty incomes, to the artisan and the labourer it is one of vital consequence. It is important to the scientific man, because its solution will show whether or not food that has undergone a change before being swallowed, similar to that which takes place in the digestive apparatus, is more readily assimilated in the body of the beast. It is important to the practical grazier; for if semi-malted and malted grain possess the flesh and fat-forming properties which many assign to it, a great end will be obtained. In the first place he will have, at the present price of raw grain, a commodity equal in nutritive value to the best linseed-cake, semi-malted at £4 per ton, malted at from £2 to £3 per ton cheaper. At present, the best linseed-cake as cattle food has no known equal, and with the scarcity of the natural cattle food (turnips, wurtzel, grasses, and green rape) during the last three seasons and the present one, it has maintained a price higher than bread, the food of man. Let the farmer once appreciate the value of germinated grain as food for cattle and sheep, as it ought to be appreciated, and he will have good grounds for saying to the linseed grower and cake crusher, “Unless you can supply me with the best linseed-cake at £8 or £9 per ton, I can and will do without your commodity.” Malt for cattle involves the interest of every meat-eating individual, for it is not enough to give man bread, withholding other comforts; but at the present high price of all kinds of meat, butter, and cheese, very little else than bread, beer, and water can be obtained by thousands of our fellow-countrymen. What is the cause of the present high price of meat? is a question I frequently hear asked, and it is a question I rarely hear correctly answered. It may be remembered by some who have read my letters to *Bell's Weekly Messenger* for October and November, 1863, that I there pointed out the grazer's difficulties. These had been then owing to two unfavourable seasons in the grass roots and green cole crops, and consequently an insufficient supply of the natural food of cattle and sheep; and, rather than buy artificial food, almost every grazier lessened the number of his breeding flock, and many gave up breeding altogether. Hence it will appear that the primary cause of the high price of meat has been the failure of the natural food-crops of our flocks and herds, and the enormous expense incurred by the grazer in substituting artificial food. The hay this year is next to an entire failure.

From the thinness of the crops it has been found that thousands of acres are not worth the cost of mowing. In this neighbourhood turnips and the artificial grasses have been sown, have vegetated, and been swept away by the fly; again sown, and again swept away; and the wurtzel is a very inferior plant. These are the raw materials of the rich juicy flesh explained by “Engineer,” in a letter on “Watery Obesity,” to the *Mark Lane Express*, January 16th of this year, and which that gentleman says “costs the farmer comparatively little;” and further, he adds that “the epicurean appetite of the public is annually becoming more squeamish about the quantity and quality of fat as compared with what it was at the commencement of the present century.” Surely “Engineer” and his epicurean friends must lately have had no other meat than fat Leicester mutton. We, in the land of the Southdowns and half-breds, have not had reason to make a similar complaint; but I am very forcibly reminded that there is such a combination of circumstances as will greatly influence the production of any kind of fat as human food, and all the squeamish public will have to find fault with will be the extravagantly high price of all kinds of meat. “Saccharized grain is not superior to the raw grain from which it is produced.” This is the sum and substance of the asserted result of the experiments carried on by the direction of the Board of Trade, and mainly conducted by Mr. Lawes, which have produced so mischievous an impression upon the minds of many agriculturists and the general public, and have been peculiarly favourable to the cause of those who oppose the repeal of the duty on malt—experiments which have given semblance of truth to Mr. Gladstone's declaration that “feeding cattle on malt is a fallacy,” and afforded some sort of justification to the determined opposition of Mr. Thompson, and others, to Sir Fitzroy Kelly's motion.

It is a new thing to feed cattle and sheep upon grain at any stage of saccharization; and at what period has anything new been introduced without meeting with opposition from the great majority of persons? Stephenson's assertion that carriages could be drawn along roads at the rate of forty miles an hour was received with contemptuous incredulity by some of the leading minds of the present century; sending messages along copper wire with the velocity of lightning, lighting towns with gas, and many other great improvements in our social system, at first were thought fallacious. The application of 4 cwt. of guano upon land, and producing an increase in weight of turnips of from 15 to 20 tons per acre, was thought a fallacy. When tea was first introduced, one boiled the leaves, ate them, and threw away the decoction; another ate the leaves dry; a third, after boiling, ate the mixture of leaves

and water with a spoon. I scarcely need remind the reader of the now esteemed value of this plant. When first introduced into Britain, potatoes as food for man were thought a fallacy; the tubers were cut young, cooked, and served at table like asparagus; the berries were next eaten, and after a variety of ways of cooking were declared "nasty things, and only fit for pigs." As with tea, so with the use of saccharized grain, the fault has been in the cooking. The material, in the form of brewer's malt (and this I have stated in former letters) is overdone, and therefore partially unfitted for use as a cattle food; but, as I shall presently show, properly-prepared saccharized grain is one of the most nutritious foods at the command of the stockmaster, and of the highest value to him in his present exigency.

Those who regard Mr. Gladstone as a prophet, those who think the malt-feeding experiments of the Board of Trade conclusive on the question, those who complacently submit to losses amongst their flocks and herds, using artificial feeding stuffs often containing 70 per cent. of impurities, and rejecting the more nutritious, wholesome, and cheaper wheat and barley; and those who are content to pay 11d. per lb. for common joints of meat, 15d. per lb. for chops and steaks, may pooh-pooh! and cry out "Humbug!" at what an humble individual like myself has to say upon the dietary and general management of live stock; but the exigencies of the present season have compelled not a few to listen more seriously to the dictates of reason and common sense, and thousands of sheep and lambs, and hundreds of horses, have been fed in this neighbourhood, during the past winter, upon semi-malted wheat and barley. On one farm alone, 100 qrs. of saccharized barley have been used as food for sheep; and at the present time seven sacks per week of germinated wheat and barley are being consumed on another farm, as food for old toothless crones and their lambs, and both are fattening fast. To test the comparative value of the two kinds of grain, one flock is having wheat, and the other barley; and to further test the harmlessness of germinated wheat, one shearing ram is eating a half-peck per day, the produce of five pints of the grain in a raw state, and is fattening as fast as a pig when fed upon barley meal, milk, and potatoes. This sheep is in a closed shed, and during the last month has had nothing to eat but semi-malted wheat. Professor Voelcker, in a report to the Anti-Malt-tax Association, on the composition of five samples of malt, says, "Too large an amount of sugar in food, it appears to me, may probably have the effect of nauseating;" but if a shearing ram can eat a half-peck of saccharized wheat every day for thirty days in succession, remain in health and fatten, there does not appear any probabilities in the case.\* Neither are there any grounds for apprehending that "malt can never be used except as a condiment, or in small quantities" (but what grazier ever thinks of using any other single kind of food to fatten an animal upon?) I am inclined to the same opinion so far as the burned porter malt is concerned; but my experiments have taught me to believe that grain, in the various forms of saccharization, is the only article of diet, with the exception of rich grass, that horses, oxen, and sheep can be fattened upon without the aid of any other food; and I will accept a challenge for any sum not exceeding £500, to fatten six oxen or fifty sheep with saccharized wheat, against any other single food, time against time, profit against profit.

White, in a book called "The Maltster," page 115, says, "To feed cattle on malt is one of the popular delusions of the day," and states that "thirty-two stones weight of barley contain 50 lbs. of nutritive or flesh-forming compound, 22½ lbs. of sugar, and 269 lbs. of gum and starch; 25½ stones of malt, the produce of 32 stones of barley, contain only 30 lbs. of flesh-forming matter, 53 lbs. of sugar, and 175 lbs. of starch. There is therefore a loss in the malting process of 20 lbs. of flesh-forming compound, and 64 lbs. of good solid fattening materials;" and Mr. White goes on to say that "the loss of weight in barley, during the process of malting, is occasioned by the rootlets of the grain feeding upon the starch when it is germinating on the floor during the sugar-forming process." And what do such gentlemen as Mr. White think becomes of the rootlets? Do they not know that they are extensively used as food for young colts, cattle, and sheep? Sir, this closet philosophy bears a striking contrast to true experimental philosophy, and to facts well known to the lowest menial on a farm.

\* Professor Voelcker appears now to take a more favourable view of malt as food for cattle.

If the quality of a feeding stuff is to be measured by the weight of its different constituents in a raw state, then wheat would be placed highest in the scale; but so far from this being the case, wheat in a raw state stands lowest, whilst in a saccharized state it stands highest in the scale of animal dietetics.

I repeat here what I have said in former letters, that to fairly estimate the value of a feeding stuff it is not sufficient that it contains a large quantity of the fat and flesh-forming constituents, but that those constituents be in a form to be acted upon within the digestive organs without deranging the functions of digestion. He who appraises a cattle food regardless of a knowledge of physiology, chemistry, and the mechanism of digestion and practical grazing, is about as capable of the business as the navigator who attempts to steer a ship at sea without a knowledge of the compass. If Mr. White, Professor Thomson, Graham, and Dr. Lyon Playfair,\* backed by the whole Board of Trade, may even by the Chancellor of the Exchequer himself, were to tell the stockmaster to use raw wheat and barley for feeding sheep, because they contain in this condition, as Mr. White has told us, the largest quantity of nutritive matter, I apprehend they would be answered in something like the following language: "Sir, our labourers are almost poisoned by drinking bad beer, and do you want us to poison our horses, our sheep, and our oxen, by giving them raw wheat and barley?" Again, to show the inconsistency of taking the weight of the different nutritive constituents of raw grain as the standard of its food value, witness the feeding of two horses, one eating a peck of raw barley, the other the same quantity in a saccharized state. The former will be poisoned, and die in a few days, whilst the latter may continue to eat the same quantity daily week after week, and have no other food, remain in perfect health, and get fat.

Surrounded by numerous extensive graziers, and having been called upon to investigate diseases which have so frequently prevailed amongst the flocks and herds of this district, I feel that I can speak with some little authority upon the subject now under discussion; and it is my duty to make known the result of my experience, for the benefit of every British stockmaster at this his most difficult period. Brought up upon a grazing farm, I have from a boy had great delight in all that concerns the management of domesticated animals; but it was not until the year 1852 that I began seriously to study the diseases and general management of cattle and sheep. In the two succeeding years, 1854-5, I had awarded to me the R. A. S.'s first prizes for two essays on the diseases of sheep. To find a suitable food for a flock debilitated by disease has always been with me a serious difficulty; and during the last three and present years, with a failure of the root and artificial grass crops, this difficulty has greatly increased. Knowing that saccharized wheat and barley was the appropriate food for horses of delicate constitutions, or which were desired to be made fat for sale, in 1855 I conceived the idea of giving germinated grain to sheep; but it was not till the year 1860 that I could induce a single grazier to listen to my suggestion. In that year a noble lord in this neighbourhood, who being always anxious to further the plans and purposes of art and science, was the first to honour me with having my suggestion carried into practice, by feeding an ewe flock upon saccharized wheat. The shepherd, a fair sample of his class, was decidedly opposed to the experiment; but the steward, fortunately a man of intelligence, and showing less prejudice against new systems than most flockmasters, willingly consented to have the grain prepared, and the flock fed as directed by me. The experiment was a success, and a great success too, for "my shepherd" condescended to confess that "sprouted wheat was capital stuff for sheep, and hoped master would let him have more of it." This year, his lordship's turnip crop being a failure, semi-malted wheat and barley have again been used; the ewes eat it before lambing, during, and after lambing; the lambs eat it *ad libitum*; and the fact of fat lambs being sold from this flock, from 10 to 13 weeks old at from 40s. to 44s. carries in itself sufficient evidence that the saccharized-grain system of sheep-feeding is not altogether to be pooh-poohed. Advising sprouted grain to a neighbouring flockmaster, I was told, as Mr. White

\* "Barley, in the act of germinating, loses a certain amount both of the constituents which form the flesh, and those which form the fat of the animal." This was the answer of Professors Thomson, Graham, and Playfair, in 1845, to the question, by the Chairman of the Board of Excise, "Is malt superior to raw grain for feeding purposes?"

in "The Maltster" has told us, that "grain in malting loses a large amount of nutritive matter." Cotton cake, costing £6 per ton, containing 80 per cent. of impurities, was given instead; barley at that time being worth only £6 5s. per ton, and when germinated contained no impurities. The green crops were deficient and bad in quality, and the results were pitiable. The ewes lost condition, the after-birth came away dark-coloured and in pieces, many in a state of decomposition, showing a want of nutrition in the body of the ewe; the lambs died by dozens, and the surviving ones remain a most pitiable lot, worth from 7s. to 12s. each. Only compare these with the lambs the nobleman sold, 10 to 13 weeks old, at from 40s. to 44s. Another breeder had been feeding an extensive breeding flock upon germinated barley: they ate it before lambing, and until the lambing season was over, and not more than one per cent. of loss of ewes, and four of lambs, had been sustained, and up to April 17th they were as healthy, beautiful, and valuable a lot of lambs as could be produced. The shepherd admitted, the steward and the owner admitted, that they had never had less trouble with the lambs, and never a finer lot. On the above date, the shepherd prevailed on his master to use beans; and beans were used instead of barley, and the results were so fearful that I feel at a loss for words to give a true picture of the case; however, in one month the flock had been reduced £300 in value. When consulted, deaths of lambs were taking place at the rate of ten daily; and although the ravages of the disease were put a stop to by medicine and suitable diet, yet the surviving lambs were reduced to the lowest possible condition. Another flockmaster had expressed his opinion that barley during malting lost much of its goodness, and used raw barley for feeding a lot of shearling wethers, and

the loss by death of between 20 and 30 of the number was the cost of the experiment. The sheep first appeared dull, walked stiffly, the body much swollen: they staggered in walking, and in twenty-four hours were paralysed; many were slaughtered immediately when noticed ill; yet so rapid had been the progress of the disease, that the fourth stomach had become dark in colour, and softened so that the finger could be easily forced through its walls, and in some cases had burst. The bowels were similarly affected, and, to use the butcher's own words, were "rotten as a pear." In these cases neither the chemical nor the mechanical law of digestion had been fulfilled: the raw grain had found its way into the fourth, a delicate stomach, without first being ground by the teeth, and acted upon within the paunch or first stomach. There it underwent the putrefactive fermentation, evolving large quantities of poisonous gases, and the sheep died, as remarked in my last letter, poisoned by the elements of their own food.

Should any of the opponents of the use of saccharized grain feel any doubt of the accuracy of my facts, or should there be any gentleman who may be desirous of pursuing the subject, for the sake of elucidating and establishing the truth upon the question, I should be most happy to introduce them to those flockmasters in this neighbourhood who are carrying out practically the principles I have advocated. In conclusion, I would remark that the repeal of the malt duty is as much a question for the meat as the beer consumer, for until restrictions in the use of saccharized grain consequent upon that obnoxious tax are removed, the product of flesh food in this country can never be developed in proportion to the wants of an increasing population.

J. SEAMAN.

Priory, S. Walden, June 30, 1865.

## FIELD AND FERN; OR SCOTTISH FLOCKS AND HERDS; BY H. H. DIXON.— A REVIEW.

The author of the two volumes before us is already favourably known to the public by his "Druid" publications, and more recently by his Essay on Shorthorns, which gained the Royal Agricultural Society's prize in the present year. If any evidence were wanting of honest industry in investigation and extensive knowledge of his subject, we should have it in these volumes; and we are greatly indebted to the author for an excellent work on one of the most important and difficult questions which can engage particular or general attention. If any time could have been selected more adapted for the treatment of stock than another, it is a season in which we are suffering, and are likely to suffer, from the high price of provisions. Causes of various kinds have combined to produce this effect upon articles of necessary consumption. It is unfair to saddle upon any one cause, be it unusual drought, or murrain, or increased consumption, that which arises to a certain extent from many causes; but of one thing we may rest assured—that he deserves well at the hands of all men, be they producers or consumers, who calls attention to the improvements which have taken place, or points to any means which may be used for increasing those necessary articles of daily consumption—the beef and mutton of these islands. The exertions of Mr. Dixon have been well directed. With a natural apology for frequent, but not vain repetitions, the author promises an occasional break from the higher subjects of his investigation, into the more lively themes of horseflesh, salmon fisheries, dogs, and game. This promise he has amply fulfilled; rendering his volumes, "North" and "South," as interesting to the general reader as they are important to those more particularly occupied in the business of agricultural life. His book is interspersed with anecdotes of men and localities sufficiently well known to most of us; and they are told with a vigour and raciness which proves his own intimate acquaintance with the subjects and his love for the labours he has undertaken.

The original intention of the author, like all other original intentions which are worth anything, seems to have been much modified by circumstances. We have all heard of the Irish gentleman who set out with a small carpet-bag and one change of linen for a short visit to his friend, and who was found in the

same place, a welcome guest, at the end of three years, with an increased stock of linen and the same bag. Mr. Dixon's first idea was a modest one—"his pleasure in the Scottish woods three summer months to take." The serious task which grew out of this pleasurable excursion "plucked the heart out of" three summers, a winter, and a spring, with about 8,000 miles of travelling, and two hundred and fifty nights away from home. The information which was collected in this extended survey of Scottish flocks and herds filled two fat note-books to the brim, and must have resembled the stuffing of the new linen into the Irish gentleman's original carpet-bag, if, indeed, that eccentric visitor has ever taken his leave. It is beyond the province of a reviewer to substitute his rapidly-stored fragments for the hard, well-digested matter of the author. It is unfair upon the writer, and upon the public. In the present instance it would be impossible to do so; the book will speak better for itself than we can for it. It is rather our office to whet the appetite far more by giving only such a general outline of Mr. Dixon's investigations as will show how really valuable his labours have been, and how much real information may be acquired by a careful comparison of "Field and Fern" with other sources of similar knowledge.

Perhaps no country has improved so rapidly, and attained such well-deserved repute, in agriculture and the breeding of stock, as Scotland. It presents itself to the inexperienced as full of natural difficulties and inadaptation for the purpose. Its character is one of presumed barrenness in many parts; and to English ears it sounds only as the Eden of the most enduring sportsman. Who that had no personal experience of the fact, and was ignorant of the names of Boswell, McCombie, Douglas, Grant Duff, of the Dukes of Athole and Richmond, Lords Kinnaird, John Scott, and Southesk, of Smith of Deanstoun, and many others, could conceive the efforts that have been made in the last five-and-twenty years to improve the breeds of native cattle and sheep, to drain successfully the unproductive lands, to reclaim the waste, to improve the fertile, and to plough and plant the "barren moor" for the benefit of mankind? Deer forests and grouse hills remain for the sportsman: the river and the loch still yield their silvery products to the fisherman in greater abundance

than of yore. They who participate in these pursuits have nothing with which to reproach increased civilization; and tens of thousands owe a debt of gratitude to the names we have quoted, for the more valuable supplies which have advanced to meet an ever-increasing demand.

When a man travels for his own pleasure there are many modes of locomotion open to him. In certain countries we advocate a knapsack and double-soles, as being the only means of enjoying its beauties; in others, a horse and saddle-bags, posters, or the rail, as the case may be. To a man of strong nerves, the transit from Bellinzona to Altorf may be accomplished with much satisfaction in the *coupe* of a diligence. When, however, the pleasure begins to assume an air of business, and the *voyageur* has laid upon himself a certain necessity, we hardly see how Mr. Dixon's plan could have been improved upon: he decided against walking, and very properly. If the body be fatigued, it is almost impossible that the mind can work successfully. The very anxiety to be at the end of a tedious journey militates against the due digestion of the information we have obtained, or (to speak metaphorically) of the aliment we have been laying up in store. He judged wisely, in a country like Scotland, when he decided upon a hack. To a man accustomed to the saddle the fatigue counts for nothing; and the advantage of pushing on as occasion offers, of getting off to walk, of transferring yourself, your hack, and your baggage to the boat or rail, if necessary, speak volumes in its favour. But let the inexperienced beware of any such temptation as the author's success holds out: he will assuredly repent him of his temerity; and when he has lost his time, his leather, and probably his horse into the bargain, he will find that a ride on an unconditioned Galloway from Caithness to Kensington is no joke. Mr. Dixon is sufficiently modest usually in speaking of himself and his exploits, a virtue not found in every journalist; but he is fully justified, as claiming some merit for sitting "three-quarters of an hour at night on a corn-bin, to be sure that the ostler does you justice": to say nothing of having "to blindfold and stuff the ears of your mare, and twist her five or six times round to make her forget which way you wanted to go, when you found a Lanarkshire or Ayrshire blast furnace roaring like a lion in your path, late at night, between yourself and your inn."

Certainly the undertaking to which he committed himself was no light one, and the *modus operandi* quite unfitted for any feather-bed excursionist.

The Scotch themselves are a pleasant and hospitable people to travel amongst; and the kindness with which our author was received, and the readiness with which information on his favourite topics was supplied, speak well for both parties. Still, even here there are certain difficulties to contend with, not so common in a country where the dialects are more familiar to the ear. Gaelic to a Southerner is embarrassing, to say the least of it—doubly so where accuracy of name is required; and we believe that few men would have cared to enter upon so peculiar a study as that of a Gaelic dictionary. We have before said that Mr. Dixon offers an apology for the dryness of his matter; and there can be no doubt that he has a right to have his claim allowed, when "ewes and widders" are compelled to form a foreground for his picture, instead of the joys and sorrows of human beings. It is true, however, that we give the reader some limited insight into the method and detail of the work itself.

Mr. Dixon, starting from Aberdeen, describes the incidents of a very unpleasant voyage, as we all know, up to the Shetlands. Here and in the Orkneys he finds ample scope for observation. He does not appear to have been bitten with the mania of Sir Henry Dryden, or to have indulged in his taste for ecclesiastical architecture, nor to have gone at once to his business in hand. The cows we may leave to speak for themselves, or, rather, we recommend the reader to the pages of "Field and Fern." It was, however, impossible to pass through such a district without a word upon horseflesh; and we have consequently a very interesting description of the ponies. Instead of carrying peat, as heretofore, they have been sent annually in numbers of from three to five hundred, to the pits. The sum of £5 10s. is said to have acted as a lure to the breeders, who have furnished of late years the Northumberland collieries. The drain upon the Shetlands accounts for a smaller supply during the last few years. The dealers' purchases, however, have during the last two summers fallen off, and have given a new impetus to the breeders. Northumberland employs the

greatest number of Shetlands, while Durham gives the preference to the Welsh. The fact is that size and weight in the collieries must tell. Men soon discover that the saving of outlay is a false economy, unless the work required is effectually performed; hence the crosses, to produce size. It is said that breeders are too indifferent there, as elsewhere, to the points of the sire. The probability is that half a loaf is better than no bread, and they take what they can get.

While on the subject of ponies, one thing is worthy of remark: we scarcely ever saw, and never had, a thoroughly bad one. They are usually enduring, usually sound, and capable of performing journeys (due regard being had to pace) to which the capability of horses bears no comparison. Many of these animals, of which the author speaks, live, more or less, entirely underground. It is no uncommon thing for them to pass four or five years deprived of daylight—some that he mentions exceed fourteen or fifteen years in the pit, and one has been a subterranean labourer for at least twenty. When we add that an average day's work is some twenty miles (half with empty tubs), we need not advert to the fact that their fodder is of the best, and most abundant. These islands are said, too, to excel in the quality of their wool, and on each sheep there are three kinds or qualities: the first quality adds to the comfort of our women in the form of veils and shawls, the latter of which can be drawn through a wedding-ring; and the other sorts make stockings of various substance. The manners, indeed, of the producers are not first-rate; for, like our Welsh friends in the midland counties, they can scarcely ever be considered as positively safe till they make their appearance upon the table.

The journey from Tain to Inverness, taken as it was at leisure by the author, presents some interesting features connected with shorthorn crosses and the rearing of calves. No truism is more thoroughly impressed in this county than the fact that you "must feed from the starting-post." There is great truth in the aphorism that all "the goodness of young things goes in at the mouth"; and whatever pains may be taken in breeding cattle, be it of whatever kind it may, they are all thrown away unless the rearing of them go hand in hand with it. Our author has not forgotten, in speaking of colour, the old Scriptural account of the force of external impressions, and he relates two very striking anecdotes on the subject. We shall allow him to tell the story in his book about the strange cat and the still stranger marks on the bullock, and the dog which chased the cow about the meadow, and had the satisfaction of welcoming a calf which corresponded to him "with photographic accuracy." In one point we can experimentally bear testimony to the observation of Mr. Dixon—that a yellow skin (and especially about Alderney and Jersey cows) denotes a well-filled pail.

In speaking of sheep farming, it would have been difficult to have avoided the vexatious question of heather burning. We have no desire to be put down as of either side—with the sheep or with the grouse; but there is no doubt that means may be found to reconcile the interests of both parties, and that the permanent advantage of the country will depend upon it. The fact is that sport, and everything connected with it, has now become such a "furor"—men are so capable of paying for their pleasures, and so happily inclined to those which have a healthy and vigorous tone, that we have no anxiety to thwart their wishes or injure their interests. We believe the two may be made, if not coincident, at least unantagonistic; and if Mr. Houstoun's rotation system of cutting the heather into squares, with considerable drainage, be found effective, we should certainly recommend its adoption. Men *must* have mutton and they *will* have moors—"the moor the merrier," as a friend of ours observed on an occasional visit to Scotland; but we never desire, with all our love of sport, to see the necessities of life sacrificed for selfish interests or pleasures. To possession are attached immense responsibilities; and an accusation has been made of late years, against Scotch proprietors, of excessive avarice. The national character stood in need of no such counterbalance to its proverbial hospitality; and the robbing of Peter to pay Paul is a mark neither of wisdom nor morality. Every man has a right to do what he will with his own, conditionally that he does with it no wrong—a truth worth studying by the owners of certain mysterious "flyers" on the turf; and it seldom happens that national prosperity is advanced by individual cupidity. The rich man wants grouse, and the price he offers for them will command a supply; but the poor man wants mutton, and as he can only afford to

give a moderate sum for his necessities, the country should be permitted to carry at least its due proportion of sheep. It is to very little purpose that crosses between Scotch sheep and Leicester or Southdowns receive so much attention if the improvement in size or quality is met by a deficiency of supply.

*Mais revenons à nos moutons*, and leave those of the Scotch lairds for the present. Dunrobin calls out the author's national taste for sport, increased as it is by the sight of Purday's and Lancaster's deer-saddles, and the details of hill craft in the Duke's gun-house; and the poetry of his nature is let loose upon the beauty of the dairy, by the ribbon borders "of pink saponarium, white nemophylla, blue salvia," and other flowers which "run ooly from the Castle gardens to the sea." The Duke's piper, too, comes into the picture, not so much for his talents as a musician as for his costume, Highlanders being as uncommon north of Inverness as they are common between Temple-bar and Nottingham, or on the sands of our fashionable watering places. Inverness and the claims of the Highland Society give Mr. Dixon a proper occasion for a good spell upon cattle. No man knows better how to make use of the opportunity. We will not rob him of the pleasure and profit, nor inflict on the general reader the pain of going through the Belvilles, the Charlottes, the Druids, the Hanton's, the Fair Maids of Perth, with all the other prize-winners and "Black Venuses" enumerated by our author here and elsewhere. We refer the enthusiast or the sceptic to his pages for gratification or conviction of the immense attention that has been given to the subject by our North British neighbours. Those accounts will be found to be interspersed with amusing anecdotes of the breeders, and with salient remarks on the peculiarities of the people; and we cannot help adding, for the benefit of others who may come after him, that from beginning to end there is not one word of ill-nature or one single breach of confidence. The gentlemen who have trusted Mr. Dixon will have no reason to repent of their confidence; and although a work of this kind must have depended for its accuracy and interest on the amount of intimacy which the author has been allowed to cultivate in certain quarters, although he may have been tempted by an appreciation of humour, which is manifestly one of his qualifications for popularity, and although the Scotch character presents as many peculiarities to an English mind as any other nation under the sun, there is scarcely a word in the two volumes which, on that score, we would desire to alter. We hope this is high praise: we mean it to be so; for the miserable instances of a contrary policy are sufficiently numerous among literary men, and we can conceive nothing so degrading to the profession.

We are glad to find a word for the Gordon setters. They are all at the Castle—"black-and-white, with a little tan on the toes, muzzle, root of the tail, and round the eyes." The late Duke is said to have preferred it for an excellent reason—the facility of seeing them on the hill side. They are described as "light in frame and merry workers." We only hope they have plenty of opportunity of displaying their qualities; for one of the most melancholy deteriorations of sport in this country is in the indifference to a good dog, and the ordinary employment of none at all. Retrievers, to be sure, are, like every dog, having their day; but such setters or pointers as we shot to twenty years ago seem to have gone out altogether. There is also a curious account of a cross with a remarkable sheep dog, taken from the *Field* newspaper. Whether well authenticated or not, we are unable to say; at least there is nothing so extraordinary in the fact as that of the Duke of Gordon's own fancy for a cross of the kind. We have seen plenty of bob-tailed pointers, in many parts of England, and all over Germany, which might have been called anything, but which went under the name of sheep dogs for the convenience of the pot-hunters and to the detriment of the Queen's Exchequer. An entertaining chapter is devoted to the late Captain Barclay, the great pedestrian, and the trainer of Cribb for his fight with Molyneux the black. We remember to have heard or read of the way in which he walked away from the post-chaise on his road to London, until the postboy and his pupil began to think they had lost the Captain altogether. His view of a country seems to have been that of Lord Cardigan, whose practical eye saw little else upon the Limekilns at Newmarket, though surrounded by the "cracks" out at exercise, than "a splendid place to manoeuvre cavalry." His Cicerone at the time, a friend of our own, takes a totally different view of the value of the neighbourhood of Newmarket, and sees more in a

Derby winner or a candidate for the St. Leger than in all the squadrons of cavalry in Great Britain. Captain Barclay was impressed with the value of "Moss Paul," as a place "to train a man" instead of a horse. The last of the Captain's line, who goes as often by the name of "Allardice" as anything else, is now in the Army, having passed his examination under the auspices of the author of "Charlie Thornhill."

In the same neighbourhood figures the well-known name of Boswell, the highest example of an improving proprietor. Not a Mechi, but one of those simple, substantial pioneers of agriculture, who set an example of economy and discipline to their tenants, instead of creating a jealous and impracticable class of farmers, who would willingly be gentlemen if they could only afford to be idle, and who never understand the difference between improvement and expense. Cortachy is connected with the name of Airlie, the present representative of which family having created for himself a respectable claim to some distinction in the House of Peers, is happy in passing a fair proportion of his time in the improvement of his estate. This is done under the superintendence of Mr. Peter Geekie, Lord Airlie's factor, and has more regard to the laying down of a permanent pasture in the midst of country said to be short of grass. The Piper is not forgotten, and Lady Airlie's dairy-farm comes in for its meed of praise. Dr. Murray, of Carnoustie, and the ups and downs of "The Cure," will delight the racing man; for if the generality of Scotchmen north of Perth are somewhat indifferent to the charms of the turf, the Doctor made up for the deficiency. We didn't know the exact value of speculation in thorough-bred stock, till we ascertained that the price paid for the horse that was second to Voltigeur in a field of sixteen sires, for the prize at Middlesborough, was 7s. 6d. As Mr. Dixon justly observes, "there must be some virtue in medical attendance, or in Carnoustie air."

In order that nothing may be wanting to make the book readable, we have a full account of Mrs. Blair and her poultry-yard, her baskets of rissoles, her Indian corn, and her enthusiastic superintendent "Annie." She has birds of all sorts, each one the best of his or her kind, and, whatever may be the state of the debtor and creditor account, she rivals the celebrated Mrs. Howard in her care and attention to her work. That lady, we believe, made several hundreds of pounds out of a pair of Cochinchina, which came originally as a present from a grateful schoolboy, to the late Mrs. Peel, the wife of the Dean of Worcester.

Perth and Dunkeld are rich in legendary lore of shooting and racing, and the account of the Caledonian hunt, with its Ayr, Perth, and Kelso meetings; its Ladies and its Lords Eglington, Mansfield, Stormont, Tweeddale, Glasgow, Wemyss, and Moray; its Whyte Melville, Little Gilmour, Sir David Moncrieffe, Alexander Ramsay, Sir David Baird, Sir John Maxwell, and the Duke of Athole, with hundreds more who have lived and died since 1777, the date of the establishment of the Club, make up a most interesting chapter, which it is wicked to forestall. Paton, the gun-maker, finds a niche as well as others, and deservedly so. He enjoys the confidence of some of the best shots in England; amongst others that of Lord Stamford, who two years ago had shot with no other guns, and had not yet been tempted by a breech-loader. Since then he has given way to fashion or conviction: with what result we know not.

The hunting of the north, whose division from the south is the Frith of Forth, is admirably summed up by the description of the Fife kennels. Those men who have known the Atherstone formerly, and who have made a renewed acquaintance with the Pychley during the last season, will be glad to hear of Mr. Anstruther Thomson's success in the north. It must be a vastly different country from that *through* which we have not unfrequently followed the gallant master. We say *through* advisedly, for Mr. Thomson's weight would scarcely allow so hard a man to go over a country so big as those in which we knew him as a rider. Whatever the deficiencies of country, however, we are well assured that it has difficulties of its own, more formidable in some respects, and of infinite value for making hounds—a consideration more in accordance with a sportsman's views than for breaking horses, a purpose to which the Atherstone and Pychley countries are too frequently put by rash young men. Other hunting has its representatives and frequent mention in both volumes; and if we were asked to select a chapter full of racy incidents, and

calculated to wake up a mind wearied with a trifle too much beef and mutton, we should recommend a perusal of the visit to Dr. Grant and Sandy, on the road from Coldstream to Hawick, in the south. We have heard of a night w' Burns, and we have strong impressions of many pleasant ones with hundreds of choice spirits; but for a gentleman with a taste for Dandie Dinmonts, badgers, ferrets, rats, vicious horses, and for rough practice of every kind, medical, cynical, and zoological, we should say a morning with Dr. Grant and his otter hounds, Robin, Walter, and Ringwood "the biggest black-guard of the lot," would be just the thing. As to giving any sort of idea of the Doctor's establishment in a review, which our space warns us must soon come to an end, we dare not think of it: the bits are so good that we can scarcely make a selection, and then feel it would be unfair to do so. Let the reader search for himself. We can guarantee him a hearty laugh over the eccentricities of the Doctor and the "happy family," of which he himself is the showman and the nucleus.

We seem to have said sufficient to explain the method and the matter of these volumes, and to recommend a perusal of the originals. Space forbids us to do what we fain would do, viz., extract a few of the anecdotes with which the driest matter is interspersed. Nor is it necessary to treat the south of Scotland with further notice than to say that it is as honestly and industriously handled, and entirely after the same fashion, as that part north of the Forth, which we have more elaborately specified: There will be found ample food for the lover of the leash, among the lowlanders. Edinburgh appears, to the abstraction of its picturesque beauties in these pages, as a great emporium of wool. The steam-plough and the fine arable land of the Lothians come in for their due share of attention. The crossing of Downs with Dorsets and Leicesters, and Mr. Douglas and the Athelstaneford herd, (upon the relative merits, as well the demerits of whose bygone cracks, their owner, who is second to no man in the United Kingdom as a judge, here makes a clean breast) are given somewhat in detail; and the remarkable "dodges" of the showy prove that the Ayrshire men are as wise in their generation as a Piccadilly dealer. The Eglinton tournament, and the athletics of the late earl and his successor, occupy a few pages; and the book winds up with a short description of one of the easiest rides through frost, rain, and eventually snow, through a country with which we are well acquainted, to Kennington. We presume the "garron" was not quite the thing for the Quorn, Mr. Tailby's, or the Pytchley pastures

around Sir Rainald Knightley's at Fawsley, or Mr. Dixon could hardly have resisted the temptation of a thaw.

The two volumes are illustrated by steel engravings of the late Duke of Richmond, Mr. Hugh Watson, late of Keillor, Professor Dick, and Mr. Nightingale, who was, until his retirement from ill health in 1860, the most popular coursing judge in England and Scotland. Thus sheep, cattle, horses, and greyhounds have each their special patron. There is also a spirited sketch of the head of the prize West Highland bull Duntroon, drawn on wood by Mr. Gourlay Steel, R.S.A., the animal painter to the Highland Society. The camera has been called in twice, first for an interior, in which Dr. Grant, "Sandy", Ringwood, Pibroch, "Shammy," and a dead otter are grouped together; and again for "A Scene at Knockhill." The latter really embodies "The Turf, the Chase, and the Leash" of Scotland. Mr. Sharp was secretary to the Caledonian Hunt Club for a quarter of a century. The white horse Pallinsburn was one of Earl Wemyss's best hunters for four seasons; and the greyhounds Carl Time and Tak Tent are no unworthy representatives of Scottish "long-tails." Still, the author is nowhere to be found among the illustrations. An old groom once asked an artist rather testily why he wasn't in a hunting picture; and that gentleman soothed him by saying, "*You are. Don't you see that hill? You're coming up the other side.*" By this rule Mr. Dixon is in the preface. We find a woodcut of his mare Cockade, all accoutred with pad, book-bag, macintosh, and valise ("just fifteen-four the lot," as the worthy Dumfriesshire bacon-dealer observed who weighed them); and her rider is no doubt taking notes in the cow-house, to whose door she is tied. This is at least a fair suggestion.

We have one word only of censure, and we are sure it will be well taken; for the fault is far too common amongst the writers on agriculture and sport throughout the kingdom. The general interest and utility of the book is somewhat lessened by the assumption of the author that the whole world is as well acquainted with places, people, polled cattle, and prize bulls as himself. In sport, this has amounted to a vulgarity of diction as common as it is incomprehensible. In agriculture and ordinary matters it leaves a blank upon the mind of the reader, which nothing but oral explanation can fill up. To persons well "up" in the subject this is unimportant; but it should always be borne in mind that one of the duties of an author is to render his subject popular, and then to elucidate it with that clearness which a popular subject deserves.

## THE SUMMER HOUSE-FEEDING OF DAIRY-STOCK.

In a former paper attention was drawn to this important and interesting subject, by showing the results attainable from a well-managed dairy-stock, by full feeding, good management, patient and never-flagging perseverance, and the most constant and untiring attention to the minutest details.

It is now proposed briefly to notice the breeds of cattle most suitable for dairy purposes, and the crops that can be grown by the farmer pursuing a system of fixed husbandry, with most advantage for the feeding of his cattle during the summer and autumn months. Keeping in view the principle that a milch cow requires full feeding during the whole of the milking season, these hints are given to draw attention to the providing of extra food at a time when dependence is apt to be placed solely on grass.

The pastures, as everyone knows who is farming light land, are often a very fluctuating source of supply; a fortnight of dry weather in May or June may so burn up the grass as to materially injure its growth for the remainder of the season. It becomes, therefore, the interest of the stock-owner to provide such food as will make him, in a great measure, independent of the season, and enable him to keep his cows in full profit and in good condition, whatever should be its character, whether wet or dry.

Getting into dairy-stock requires a considerable amount of care and attention—as to the breed most suitable for the land on which they are proposed to be put, and the situation of the land, whether high or low, exposed or sheltered; as a very

slight climatic difference exercises a large amount of influence on such a sensitive animal as a milch cow.

Choice having been made of the breed, it will well repay the intending purchaser to exercise a little care, and go to some extra trouble, and even expense, for the purpose of procuring animals from an inferior soil to his own, as such animals, if of a good sort and well bred, will at once begin to thrive, and before they have been many months on their new pasture will exhibit a marked improvement in condition and produce. If the contrary course has been pursued, and fine-looking animals from a superior soil and it may be climate, have been purchased, deterioration is almost sure to show itself, which will continue until the cattle have been reduced to the size and condition at which the land will maintain them. Where house-feeding is carried out with regularity, this difference will not, of course, show itself quite so decidedly; still this is a point which will, under any circumstances, well repay a little attention and consideration on the part of the farmer.

The large graziers who supply the metropolitan and other extensive markets are well aware of this tendency in cattle to improve or deteriorate when changed from their native soil, and prefer stocking their pastures with well-bred healthy animals, purchased from breeders occupying land much inferior to their own.

So great is the tendency to improve, shown by cattle removed from middling soils to those of first-class quality, that, after being from two to three months on such land as the rich

feeding grounds of the English midland counties, the vale of the Clyde in Scotland, the golden vein in counties Tipperary and Limerick in Ireland, their former owners, if happening to see them, have the greatest difficulty in recognising the animals they themselves had reared.

A great matter in the selecting of milking stock is procuring them from herds of known superiority in milking qualities. In the case of pure breeds, this can be done with comparative ease, as in most districts there are herds celebrated for the abundance of their produce, the young and surplus animals from which being obtainable at somewhat higher prices than the average value, on account of the celebrity of the parent stock.

In the absence of such opportunity, recourse must be had to the fairs and markets of the neighbourhood. In the case of gentlemen stocking, or even extensive farmers, it is mostly better to purchase from a respectable dealer of known character for probity and straightforward dealing. No one could possibly object to pay a dealer worthy of confidence a pound a-head profit; and it will invariably be found that it has been twenty shillings remarkably well spent. On consideration, it is hard to say whether it will be spent at all, as a man who is at every fair within his reach, for the purpose of purchasing and disposing of stock, becomes such an adept that he will pick out the animals suitable for his purpose, and have them bought, while the man who is only occasionally a purchaser would be only in the act of searching for them. Sellers have commonly much less huxtering (to use a common phrase) with a well-known dealer than with a stranger, or a person whom they know is not very well acquainted with the value; and thus the dealer has a double advantage.

If purchasing at a time when distemper is prevalent, it is a very safe thing to purchase through a dealer, as he, being aware of who has distemper, and even knowing the neighbours of those who have it, he will, careful of his own reputation, have nothing whatever to do with their cattle.

No dealer of established character will knowingly buy animals from a tainted herd, however great may be the temptation in the way of profit; and that very fact ought to be an inducement to tenant-farmers and gentlemen-farmers alike to give the dealers more encouragement than they usually do. They are a shrewd, indefatigable, and hard-working class of men; and by penetrating into the remotest districts, and even travelling from farm to farm, form a connecting link between breeder and feeder highly useful, perfectly natural and in an eminent degree favourable to the interests of both parties.

Next to providing plentiful supplies of food, probably the most important matter to be attended to is, the buying cows that, from their form, general appearance and descent, will have a good prospect of turning out good milkers.

The season may be an unfavourable one, and the hay be spoiled or much injured; it may be a dry one, and the grass consequently bad and the turnips inferior—these can all be borne and with patience too, as they are absolutely unavoidable. But when a stock-owner has been fortunate in his endeavours to provide good hay and plenty of it—turnips and other food all right both as to quantity and quality—there is scarcely anything more intensely galling, and the memory of which will stick longer to him, than to find, on balancing his books at the close of the season, that he has been putting all his carefully and expensively-raised food into bad skins; in short, that he has taken his goods to an unprofitable market.

In selecting a milch cow, the best judge will at times be deceived; as a cow of very promising appearance, coarse, thick-necked, and big-boned, will often be a prime milker, while a cow of the most approved form will now and again prove so worthless as not to be worth house-room as far as her milking qualities are concerned.

Whatever the breed of cattle, it will generally be found that cows with the following characteristics moderately well developed will have a good chance of turning out good milkers: The head light and long, forehead broad, horn not too thick, but clean, and in some breeds waxy (as the shorthorn for instance); the eye clear and rather prominent, neck rather thin, forepart light, back straight, broad over the loins; ribs well sprung, and the carcass deep; bone not too heavy; udder nicely formed, well forward, with skin soft and elastic, the paps well set out from each other, and neither noticeably large nor yet inconveniently small; lastly, the tail of a good milk

cow is nearly always long and thin, almost whip-like in its appearance.

It is worthy of note that the influence of the bull on the milking properties of his progeny is very considerable. So well is this understood in Lanarkshire and other districts where milk alone is the object of the farmer, that much trouble and expense is gone to, for the purpose of procuring a bull from a herd of admitted excellence. No matter how diminutive he may be (and to the eyes of those accustomed to short-horns or other large breeds, Ayrshire bulls look particularly so), if he is out of a milky stock the object of the purchaser is gained; and much praise is frequently lavished on a two-year-old animal, not much bigger probably than a shorthorn calf of six months.

There are many useful breeds of cattle in the three kingdoms, some of them but little known outside the county or district whence they derive their distinctive appellation, but still worth adhering to and keeping pure for some quality peculiarly their own—feeding it may be, dairy purposes, or labour. Amongst those breeds chiefly reared and kept for the production of beef, the shorthorn, Hereford, and polled Angus hold a very prominent and deservedly high position. Each breed has its supporters, many of whom have attained a world-wide fame; and certainly the style in which they turn out their favourites, whether to the show-yard of the Agricultural Society or consigned for sale to a London salesmaster, does them infinite credit.

Although amongst these breeds a good milker is by no means rare, and even in an exceptional herd the milking quality may be found well developed, it is not pretended by their most ardent admirers that they would suit in their purity to be kept solely on account of their milking properties, and would make profitable dairy stock. Had they no other property, however, than early maturity and heavy weight, they would for that alone be invaluable. Of late years, the shorthorn has been the favourite, and the blood of that breed has spread with wonderful rapidity, not only in these kingdoms, but on the continent of Europe, America, and Australia.

The improvement effected by the infusion of shorthorn blood in Ireland alone during the last few years is most gratifying to all the well-wishers of that beautiful country. Twenty years ago, and even less, the fairs were filled with gaunt and scraggy animals, with long horns and coarse, thick hides, narrow over the loins, the rumps light, being mostly drooping, while the tail stuck up like the keel of a boat. Now the same fairs are well supplied with beautiful young stock, straight along the back as a gun-barrel, presenting, if it were only in this respect, a marked difference to the cattle of former years—handsome in their general outline, and particularly so in the set and appearance of the horns and marking of the skin.

Immense numbers of young cattle are shipped weekly for England and Scotland, the receipts for which form a large, and, of late years, one of the surest sources of revenue of the Irish farmer. A most significant and gratifying fact in connection with the Irish export trade in cattle was the presence at the recent Falkirk tryst of such a number of Irish cattle as to constitute the staple of the largest August market that has been held on that stance for the last ten years. A very few years ago Irish cattle at these markets occupied a very insignificant place, the large buyers scarcely deigning to look at them, and the farmers of the neighbourhood openly scouting the idea of purchasing them. As already stated, the large infusion of Shorthorn blood that has taken place during the past few years in Ireland has been the chief cause of the pleasing results now mentioned.

Of breeds in general use, and of acknowledged merit for dairy purposes, are the Dutch, Shorthorns, Crosses, and the Ayrshire. Dutch cattle are of large size; prevailing colour black, with sometimes a white patch over the back, resembling a sheet and are, from this, distinguished by the name of sheeted cows. They are heavy milkers, but the milk is of rather poor quality, and not very productive of butter. For this reason they are more suitable for parties who have large contracts and supply work-houses, prisons, hospitals, and other public institutions with milk, than for the ordinary farmer who has to manufacture his produce into butter and cheese. Another very serious objection to Dutch cattle is the difficulty of fattening them when past their prime, and the large quantity of food they consume in the endeavour to prepare them for the butcher. On account of these two faults in the character of



this, at one time rather popular breed, they have of late years been going down in public estimation. There are a few districts where they are still to be found pure, and there are county agricultural societies that still reserve a section for Dutch cattle; but the entries are yearly getting fewer, and will in all probability shortly cease.

Of all other descriptions of cattle, Shorthorn Crosses are now the most popular, where dairy business and rearing and feeding are carried on simultaneously. They are, for the most part, admirable milkers; their calves, both heifers and bullocks, can be fed-off at an early age, and, coming to heavy weights, bring large and remunerative prices: while the cows themselves, when no longer useful for the dairy, are easily fattened, and can be quickly got rid of. In the three kingdoms, but more particularly England and Ireland, this variety of cattle is to be found in every county, and on every kind of land, varying in size, of course, according to the quality of the land. The same distinctive features are, however, always retained, and they attain an immense size, and give extraordinary quantities of milk, where the soil is rich and the climate congenial to their habits and constitution.

The Ayrshire next claims attention; and it may be concluded with safety that when dairy produce is the sole object, and where the land is light and of indifferent quality, this breed is the most valuable of any. Mere size in this case is not much of an object, as the small Ayrshire is considered a better dairy cow than the larger or medium sized variety. To keep them small in size, and partly to adapt them to the inferior pastures of Ayrshire and neighbouring counties, they are very moderately kept in the earlier stages of their growth, particularly in the second year. This is supposed to add to their milking properties, and as they are generally made to produce at the age of two years, an Ayrshire cow on her native pastures is usually very small indeed. When removed to other countries, and placed upon richer pasture, they grow larger; but by doing so, the milking powers are unquestionably injured. So marked is this principle, that the Ayrshire cow is seldom found in the same perfection, as a milker, as she is to be seen on her native soil, which may be said to comprise the county from which she derives her name, and the adjacent counties of Lanark, Renfrew, and Dumfries. There she takes her position as the dairy cow *par excellence*, and is highly and deservedly prized.

In these counties dairy farming pays well, the farmers having such a ready market for their products amongst the lime mining and manufacturing population of Ayrshire, Renfrewshire, and Lanarkshire, and on the opposite side of the Clyde, at Dumfries, and at Helensburgh, and other watering places on the Gare-Loch. In all these districts the price of milk and fresh butter is always very high, giving the surrounding farmers the advantage of being able to extract the largest return obtainable from a cow in any part of the kingdom.

If the returns of an extensive stock-owner in Ireland were compared with those of a middling farmer in Lanarkshire, who sends his milk into Glasgow every morning, it would probably be found that the latter was just about double the former; this result aided by good feeding, but mainly due to the difference in price obtained for the produce. This alludes of course to the large inland stock-holder, who has no other way of disposing of his produce than by making butter for the large markets, and feeding pigs with the milk. In the neighbourhood of Belfast, Dublin, and Cork there are dairy farmers who understand the feeding of a cow right well, and make an extraordinary sum per cow per annum; but they have not the dense population to supply that the farmers in the districts above-mentioned have, and therefore they never can attain to the same aggregate receipts.

To all farmers residing in the vicinity of large towns, a supply of house food is mostly attainable from the breweries and distilleries during the entire season; for although they may not be at work always, yet by storing the grains and treading them down in pits, so as to exclude the air, they form, after undergoing a slight fermentation, almost better food than when fresh from the brewery. Large returns are made from the use of this food; but from the almost periodical visitations of distemper that occur when grains and wash are largely used, the profits come in the end to be considerably reduced. Overlooking this rather serious objection, it is quite evident that, although they were desirous of doing so, the majority of farmers are so situated

that the getting of such food for their cattle is simply an impossibility, and must therefore, to obtain a supply of house feeding for the summer, cultivate such crops as will come on in succession to be ready when the turnips and mangolds are finished in the spring, and continuing on during the entire summer and autumn, until the Grey-stone, Pomeranian, and other soft turnips are available to take their place. When milking cattle are highly fed, and means are used to extract the utmost amount of produce that they are capable of giving, experience shows that there is considerable advantage in varying the food as much as possible. If one description of food is constantly used, the cows tire of it, and do not eat it so greedily, and by-and-by an unpleasant and unexpected reduction in their productiveness is experienced. It is quite possible that the novelty of a change of food acts as a stimulus to the whole system of the animal, and promotes the secretions.

Amongst the crops that can be successfully and profitably grown for the summer-feeding of cows; cabbages, Italian ryegrass, clover and tares or vetches are the most prominent and most useful. Sainfoin and lucerne are also valuable plants for green fodder, and on certain soils and favourable situations give a large amount of food. The cultivation of these plants does not, however, seem to be extending; and it would be very difficult to bring them into general use in the three kingdoms. At present their cultivation appears to be confined to England, the chalky soils abounding there suiting the sainfoin particularly well.

Cabbages are an excellent food for milch cows, and by regulating the sowings, they can be had for a lengthened period of the year. This plant being a gross feeder requires abundance of manure; without therefore giving it a plentiful supply, there is no use in attempting its cultivation. By deep cultivation and liberal manuring, cabbages can be grown to the extraordinary weight of 30 lbs. each. The weight per acre is enormous, and the return to the manure heap is correspondingly large. This valuable plant has not taken the position as a field crop that it deserves, few farmers having an extensive break of cabbages. This is probably owing to the trouble unavoidable in transplanting them, the loss of plants from dry weather and careless planting, few ordinary farm-men being adepts at this operation. Should the farmer not choose to occupy a portion of his regular green crop break with this plant, it will well repay him to have an acre near the farm-yard planted with them; and if they are, now and then during the growing season, watered with the drainings of the dunghill, or the contents of the liquid-manure tank, he will have in the autumn a most acceptable addition to his stock of house food.

Italian ryegrass coming in early in the season is useful, if on no other account; but, like the cabbage, unless the farmer is prepared to give it an unlimited amount of manure, liquid being most suitable, it is much better for him not to grow it. On poor or worn-out soils, or even on rich soils, where it is attempted to make repeated cuttings without subsequent top-dressings, it is absolute folly to grow it. On such land as the water-meadows of Edinburgh, that receive the sewage as it leaves the city, this plant gives an immense return, and from its being fit to cut at such an early period of the year, its value is greatly enhanced. Where the farmer is so circumstanced that he can by gravitation throw the droppings of his yards on a few acres, or where the land is easily reached by a water cart, he may grow heavy crops that will prove of great benefit to his stock during the summer season; but unless the watering can be done economically, it will not pay.

Clover, thriving so well upon light soils, and coming in as it does as part of the usual rotation on the farm, forms an extensive and valuable addition to the stock of summer-house-food. A portion of the first year's seeds can be cut early, beginning, if a favourable season, about the second week of May, and going on until it becomes too hard for soiling, the remainder being made into hay. Shortly after cutting and removing the hay, the clover is forward enough to be cut a second time, giving a large amount of excellent food, and worth to the extensive stock-master a very respectable sum in hard cash of the acre.

The last, but by no means the least important crop remaining to be noticed is the vetch or tare. In this valuable legum. really the whole strength of the stock-feeder lies, as the various sowings come in so conveniently as not only to create a diversity of food, but keeps up the supply with uninterrupted regularity for nearly six months of the year. Taking the case with



which it is cultivated and its excellent feeding properties into consideration, it is questionable if there is a more valuable plant known or cultivated in modern husbandry. They form a capital article of food for all the animals usually found on the farm—the horse, cow, sheep, and pig; and all thrive equally well upon them. For cows they are invaluable, as although they do not greatly increase the flow of milk, yet it is rich in butter, and the quality excellent, the texture being firm, and the flavour delicious. When sown, on land well prepared by grubbing, ploughing and manuring, about the end of August, they will come in by the 25th of April following, if the season is favourable and the situation sheltered. A mistake is often made by being too long in beginning to cut this crop, as before the sowing is finished it is apt, if a heavy crop, to rot on the ground, and thereby cause a good deal of loss, at a period of the year, too, when it cannot very well be spared. This can easily be obviated by making small sowings at a time, and cutting early. However green and succulent they may be, vetches will not scour cattle—a quality in rich green food very desirable. Vetches are usually termed a stolen crop, coming in, as they do, at a period of the year that admits of turnips or other green crop following them the same season. It is no loss to the farmer, however, to have one or two small sowings even so late as that they will be the only crop on that portion of his land for the season, as by that means a supply of food is

provided that will keep the cattle off the winter food until winter really has arrived (no slight consideration), and the summer quality of the butter is retained to a more extended period than is usually the case. There is no way cows will eat vetches with greater relish, or in greater quantity, than when just freshly cut, and brought in without lying in the sun. To have them eaten thoroughly clean, it is a good plan for the man in charge to begin at one end of the stall, giving a small forkful to each cow as he goes along. By the time he has the last one served the first is ready for a second allowance, which he at once proceeds to give; and so on, perhaps even to a third time. It is wonderful what an amount of interest a man who really loves the animals under his charge will take in enticing them to eat, and how well he will succeed. The same quantity of food put in before them all at once, would not be eaten with the same relish, and considerable portions would remain that no amount of coaxing afterwards would induce them to touch.

The leading features of this subject having now been touched upon, we draw to a close, but cannot conclude without recommending the most constant care and assiduous attention to every department of this business, as without the active supervision of the master or mistress it seldom does well, and even under the most favourable circumstances will fail of producing the results that might reasonably be expected. J. S.

## AUTUMNAL AGRICULTURAL SPEECHIFYING.

Two of the most curious features in "extra parliamentary utterances," and the way in which noblemen deliver their sentiments to their tenants and neighbours, are the confident and glib manner in which every old and new point of agriculture is discussed and "settled," and the warmth with which tenant-farmers are held up as deserving objects for a public man's anxious care and solicitude. But why should there be all this expenditure of breath upon practical farmers exclusively? Matters of this sort are becoming sadly monotonous and wearisome. If public men must talk—that is, if they consider it their duty to say something at the county meetings which periodically occur—why not vary the mode of address? why not let the lecture, or off-hand after-dinner speech, turn occasionally on cotton-spinning, silk-weaving, or ship-building, or some other branch of the nation's business? Why should farmers be the only class which, it is thought, need the assistance and advice of noble lords, M.P.'s, and aspirants generally for public fame and honours? The discussion of calicoes and ribbons, and stems, bows, sterna, and yard-arms, if judiciously done, would at least have the freshness of novelty, and be without that seed of irritation which is so often sown when men talk about things which they generally admit they do not understand, to men whose interest and business it is to have in respect to them a thorough knowledge. These suggestions we make under the conventional supposition that the chairman must make a speech of some kind about twenty minutes or half-an-hour in length, and that the other gentlemen who sit at the cross-table or "above the salt," and into whose hands the remaining toasts of the day are put, must follow suit. But if we may freely give an opinion, we should say that it would be far better for the gentlemen at the cross-table to "cut it short" at an agricultural meeting, and by this means devote one day in the year to listening to what some of the many intelligent practical men could say, if the opportunity were given them. Thus, while sound practical and scientific knowledge would be tapped and encouraged to flow for propagation in the county in which it was verbally expressed, and throughout the country on the "wing of the press," gentlemen who spend the "season" in London and the remainder of the year in the country would be gradually instructed, and perhaps, in time, become proficient in practical agricultural questions—such as economy of capital and profit and loss—in regard to which, according to their own "utterances," they are now, generally speaking, most lamentably inexperienced.

These reflections have been revived by a speech made by Earl Grey, as chairman of the Northumberland Society, at the dinner of that body, at Morpeth, a report of which will be found on page 216. Earl Grey entered minutely, and with

considerable energy, into almost every point which belongs to modern practice; and by the tone which clearly pervades the speech of the noble earl, it seems to him to be a matter of great surprise, as well as extreme pleasure, that practical farmers have not adhered to the rude implements and ancient practices, which were taken as a matter-of-course, and sufficient, fifty years ago, when the art of war was thought more of than the arts of peace. To Earl Grey this may be a source of great personal comfort, and the pleasure it would afford him in congratulating his friends on the discovery would no doubt be equally delightful; but to men who have been mixing with farmers during the above period, and who have thereby become familiar with their business-habits and sound judgment, there will be no room for an expression of joy and wonderment.

In support, however, of the above principal views and theories, Earl Grey discussed the show of stock and implements, which, he said, "gave abundant evidence of the progress which agriculture was making in the county." This is certainly an interesting conclusion, but it is not an original one by a long way. The decreasing cost of harvesting was another point; on which, even with the use of machinery, in the absence of hand-labour, as a necessity, most farmers will say the noble earl was not accurate. The blessings which belong to wool, both as regards its comfort to the poor, and the help the high prices of that article, from a greater demand, was likely to confer on tenant farmers, were not lost sight of. Nor were the cheering prospects which belong to increased rents forgotten. But let us be exact on this point. Said the noble earl, using a judicious amount of lubrication to the biggest bolus of his fanciful creations: "No doubt the farmers had a hard task in bringing about the great improvements they had done; but they had proved themselves equal to the task, and the proof of it was that at that moment the price of land in Northumberland was higher than at any former period, and it apparently tended rather to rise than to fall." Then the noble earl came to root growing, and the advantages to be derived from that greater meat-producing system, and particularly where "the use of portable rails or tramways" was adopted, "which in some parts of England was carried out to a great extent (!), and which did very much in preventing land from being injured in getting away the crops." We should very much like to know who was Earl Grey's informant on the "great extent" to which these "portable rails or tramways" are used in any part of England for agricultural purposes; and also who it is that needs to be informed that if these auxiliaries be used the remainder will follow. For Earl Grey's information we may tell him that no branch of farming can afford a profit on the use of

such a system for getting crops off. If any one attempts a course of cropping that would be likely to require these appliances, then the attempt would be wrong, and not the use of the framway to lessen a difficulty right. This theory of course applied to heavy land, the discussion of which would not therefore have been complete had not the marvellous effects of steam-ploughing been quoted and cheerfully extolled. Some other matters were gone into, and to the gentlemen amateurs and town-bred politicians the whole speech was, no doubt, an intellectual as well as a political treat; but, unfortunately, for a picture so happily drawn and delightful to look upon, the whole thing to practised and professional eyes and ears is an utter absurdity. This conclusion we will not confirm by any ingenious argument that naturally suggested itself in abundance during the reading of the speech before us, but we will leave Earl Grey to show how easy it is for any one to raise questions, and, when the ground-work of the subject is not understood, how much more easy it is to argue illogically and thereby come to the most inconsistent and therefore un-instructive and damaging opinions.

How can the following be possibly made to harmonize with the foregoing? "Agriculture was extending and improving all over the world. the facilities of transporting corn were also increasing. Foreign countries were adopting railways, and even those countries which had been most behind and the exception were now adopting the railway. Thus those increased facilities were rendering the transport of corn to our shores from foreign countries more easy, and our population were enjoying the inestimable benefits of that cheap food which conduced so much to the general prosperity, and it was not likely we should return to the old prices."

How can these views, which are the only ones made by Earl Grey that had the slightest semblance of business accuracy in them, be reconciled with increasing rents, the expenses attendant upon the use of more machinery (whether by steam or horse power), and the high price of manual labour? As we have before said, from farmers having been so crippled by low prices of corn that they could not afford to employ men in the winter, the best of them have therefore deserted their native village and left farmers in the lurch at busy seasons. The fact is a large per-centage of land must go down to ryegrass, clover, and other perennials, and the cost of machinery, horses, and manual labour be thereby lessened by two-thirds. The *Cleveland* correspondent of the *Mark Lane Express* hit this question off in these few words: "Grass is the great thing needful, and the price of labour and of grain will, in this district, compel a large acreage to be seeded down." Other correspondents pointed as clearly to the same self-saving practice which the British farmer must pursue. Earl Grey, and the

theorists who agree with him, overlook two great facts, viz., that corn can be grown in "virgin" countries, where rents are nominal, at less cost for labour than it can be in this country: and then, when so grown, it can be delivered in London or Liverpool, from the other side of the Atlantic or Baltic, as cheaply as corn can be carried to the same towns from some parts of Northumberland. If present prospects are to continue, as above foreshadowed by Earl Grey, the labour-saving system of laying down to grass must be as much as possible adopted. For, paradoxical as it may seem to theorists, by a farmer thus reducing his returns, his profits will be considerably increased. But this result will ensue in this way: The cost of horse and manual labour on an arable farm in growing roots and corn will be quite two-thirds more than the expenses of grazing land. Then, as the production of meat will be less on the grass land than it would be on the arable, the price of fat stock will be more per stone, which will be another element in increasing the grazier's profit on a less expenditure. It is no use for Earl Grey to attempt to make water run up-hill. Nor must the noble Earl, and his admirers and followers, expect that farmers can pursue their business for benevolent purposes. The same principles which govern commerce, trade, and manufactures must sooner or later regulate agriculture. The whole thing turns on a question of capital, and the profit and loss on capital employed. If the public have to pay more for meat, butter, and cheese, that is the public's affair, and not the farmers'. The British farmer is now pursuing his business under laws which admit of his being undersold in matters of corn, therefore to save himself he must reduce his expenses by growing as little of it as possible. Should paying prices again ever occur, the land can be again broken up for straw crops, and it will then be improved for producing them.

Towards the close of his speech, Earl Grey expressed himself with that noble-minded modesty which is ever to be admired, and (agriculturally considered) with that self-appreciation which, when acted upon, is even more commendable: "He thought he ought to make some apology for having, as a person who could boast of comparatively little practical knowledge, ventured to address his remarks to persons of whom he had no doubt nine-tenths knew far more about these matters than he did." What a pity it is that the noble Earl did not, subsequently to proposing "Success to the Northumberland Agricultural Society," give another turn to the above sentiments, and then call upon one or more of the nine-tenths referred to, to give him the information which he, by his own admission, as well as the evidence of his "utterances," greatly needed—that is, if the noble Earl desired to rightly view the "signs of the times," and thereby to be able at some future time to make a sound agricultural speech. W. W. G.

## FOREIGN AGRICULTURAL GOSSIP.

A review of a few miscellaneous matters may be acceptable. Among special agricultural exhibitions arranged for in France, we may mention one which the prefect of the Aveyron has just created for the sheep breed of Larzac, and which will take place Sept. 26th and 27th. Some rather celebrated cheese, made at Roquefort, is produced from the milk of the Larzac ewes; and at the exhibition just organized, admission will only be accorded to animals of this breed proceeding from the departments of the Aveyron, the Gard, the Hérault, and the Lozère. There will be two categories—one of animals reared on the plateaux of the district, and the other of animals reared in the valleys. The prizes will be awarded with reference to the three products of the Larzac breed: first, milk; secondly, wool; thirdly, flesh. Besides class prizes, there will be a prize of honour of 26 for the most remarkable flock of the district. A departmental exhibition will also be held by the Central Agricultural Society of the Puy-de-Dôme, at Thiers, from Aug. 31st to Sept. 3rd. "Prizes of honour" are proposed to be accorded for the best directed working, for *métayage*, and for gardening and fruit-tree culture. Prizes are also to be given to deserving agricultural servants, &c.—It is satisfactory to observe that an increasingly large number of eminent Frenchmen are interesting themselves in agricultural matters. As an instance of this we may note that the agricultural show of the canton of St. Julien, in the *arrondissement* of Rochecourt, in the Haute-Vienne, will be presided over, Sept. 17th,

by M. de la Guéronnière, senator, editor-in-chief of the journal *La France*, and president of the general council of the department of the Haute-Vienne.—The Norman Association has held an agricultural and industrial congress at Coutances. This association was founded by M. de Caumont, who devoted himself to its interests with much zeal.—A happy innovation was introduced last year, in the shape of conferences conducted on the field of the exhibition, by M. Corbière, veterinary surgeon and secretary of the agricultural society of Lesieux. In presence of a numerous public, and with stock on the spot, M. Corbière demonstrated the points of study which animals presented with reference to their conformation, their various aptitudes, and the ameliorations which they are capable of receiving.—The Emperor Napoleon, appreciating the services rendered to agriculture by M. Lacour-Lebailly, laureate of the prize of honour in 1869, and an agriculturist at St. Fargeau, has conferred on him the cross of the Legion of Honour.—We may also mention an exhibition held at Liancourt by the Clermont Agricultural Society in the Oise. At Liancourt is an implement establishment founded by M. Duvoir, and now directed by M. Albaret. M. Albaret constructs steam engines intended to work in the fields; and steam tillage may possibly make a certain progress in France through his exertions.—Experiments of a satisfactory character continue to be made in the south. The agriculture of the south of France is a good deal tried at present; and it is especially

the south-west which complains the most. Its complaints are legitimate; but it can only obtain satisfaction by mixing in the general movement which the whole country follows. Upon the sufferings of agriculturists in his district, the Comte de Noailles writes as follows from Buzet in the Lot-et-Garonne: "In the plains which border the Garonne, and which have so great a reputation for fertility, the wheat crop of 1885 has been deplorable; never have I seen it so bad. The most fortunate cultivators—and they are a small number—are at least half below the results of an ordinary year; in many cases, the crops have fallen off to the extent of two-thirds, and some even to the extent of three-fourths. Notwithstanding an almost complete failure of the crop, wheat still sells at almost the same price as it realized at the corresponding period of 1864. Everywhere proprietors are reducing their works and restricting their expenses. Cattle are diminishing every day in value from a want of purchasers in a position to pay for them. Products of all kinds, fruits, &c., no longer find purchasers, speculation being at a standstill in almost everything. The winter will be a trying one. It is easy to foresee the lot of country labourers. Many will go into the towns; and this will be so many arms lost for ever. Properties will be badly worked; and sheds, badly attended, will not return the necessary manure to the soil. The discouragement experienced is thus profound and general." We hope the Comte de Noailles thinks he has "piled up the agony" to a sufficient extent; if the picture is half as gloomy as he would have it, it is an extremely discouraging one—M. De Monny de Mornay, director of agriculture, an officer of the Legion of Honour since 1854, has been promoted to the rank of commander. Many other French agriculturists of more or less eminence have also received promotions and appointments in connection with the Legion: among them may be mentioned MM. Gueymard, Ayllies, Goirond de Labaume, Paganon, Charles Jobez, Naudin, Teyssier des Farges, Henri Marès, Hardy, De Sainthorent, Duponchal, &c.—The forage-dearth which threatened French stock with famine must be met by all possible means. Happily recent rains have enabled herbaceous vegetation to display great vigour in the autumn, and farmers may now hope in consequence to replace in part the straw which has made default, and the first cuts of natural and artificial forage which have failed. The facts noted show how right it is to attach importance to the propagation of forage which will grow in the latter months of the year, and it is on this ground that M. Barral has applied himself with energy to the propagation of *Brome de Schrader*. M. Ponsard, of Omev, writes that he has been very well satisfied with trials made of rustic lucerne.—The note of M. de Lavergne on the diminution in the number of sheep in France has found contradictions at the sittings of the Central Agricultural Society of France. In the opinion of M. Barral the conclusions to be drawn from totals based on the statistics of 1852 and 1857 could only have value in so far as the two elements of the calculation were comparable with each other. This condition M. Barral considered was far from being fulfilled, as at present if statisticians have collected and registered totals they have never said to what degree of approximation they had pushed their calculations. Besides, if a diminution in the numbers of flocks has arisen under the influence of disease, and particularly of the watery cachexy of 1851 and 1855, it is possible, and even probable, that the evil is now completely repaired, and that the statistics collected in 1862, but which have not yet been made public, would indicate an augmentation in the "effective." M. Barral further observed that in the estimates referred to by M. de Lavergne account was only taken of the number of head, while regard must be had to the average weight of the animals, which has notably increased since the introduction of English breeds has favoured those numerous crossings, which have augmented the size and improved the general conformation of indigenous French sheep breeds. Good reasons are not wanting, then, for rejecting the conclusions drawn inferentially from the note of M. de Lavergne. It may be remarked that the eminent economist has affirmed nothing, but that he has confined himself to comparing with each other the results of the statistics of 1852 and 1857, calling the attention of cultivators and agronomes to a situation which might be considered to present cause for uneasiness if it were confirmed. At the same time, MM. Delafond and Reynal did not consider it doubtful, from observations they had made, that from 1851 to 1855, watery cachexy decimated flocks in several departments,

and that a great many flocks were sacrificed from the fear of evil to come. Besides, the suppression of *saime pature* has caused a certain quantity of sheep to disappear, and the breaking up of heaths in the centre of France has exerted the same influence. In the case of many cultivators, in fact, the maintenance of a flock of sheep was intimately associated with the possession of heath, on which the poor sent a scurvy lot of six or eight sheep, escorted by two dogs, one or two children, and sometimes even a woman. This state of affairs, of which M. Moll was a witness in Poitou, has become greatly modified since the heaths have been brought into cultivation, and since the scarcity of labour has given an important value to the work of women and even of infants. With the advent of arable culture, heath has disappeared, and on many points sheep have given place to horned cattle. In part of the east of France the rendering valuable and letting of communal properties has brought about the same results, so that the fact, indicated in the note of M. de Lavergne do not remain without explanation, or, at any rate, without an appearance of probability. The French appear to regard the sheep, rightly or wrongly, as essentially the beast of poor lands and poor districts, and some of them only rub their hands complacently if he cedes the *pas* to more productive and more easily maintained species. But, properly speaking, sheep-breeding is not in a bad position in France. If wool does not attain a very high quotation, at least it is not very greatly depressed, and meat sells at tolerably remunerative prices. Forage cultivation is making continuous progress, and flocks are being notably improved from all points of view, so that the increase in quality and weight compensates for the decrease in numbers. Such are some of the hypotheses set up on a subject of considerable interest. At the same time, all parties agree that it would be desirable to have at hand the last statistics collected in 1862. Statistics are not like wine, improved by the lapse of time; indeed, if they are to be of any use for national purposes, they must be made available for the examination of the public within a few months of their collection.

## BARLEY AND MUSHROOMS.

SIR,—Wet nights and warm days make barley and mushrooms sprout, neither of which facts are profitable or pleasurable to the farmer; for the town or village cadger steals the snare, and the Chancellor of the Exchequer claps £5 an acre on sprouted barley. So in a wet, warm August the farmer has but a poor time of it. The old tale is likely to be proved, that if barley were turned one way only it would reach the stack-yard: any how it reaches it in bad plight, and the farmer asks himself where he is to sell, and the maltster where he is to buy, all which anxiety is mainly caused by the £5 an acre tax. All other commodities have a relative and graduated value, but barley is *fine or bad*; a few days' rain or a laid crop makes all the difference between malting and grinding, and this because of the £5 an acre duty. I plough about 300 acres, and I fear I have not this year a quarter of barley fit for Burton. Being a born child, I do not venture to sow a full rotation acreage, but take spring wheat on the best land. Taking half of the five-course shift (30 acres) I may have about 160 quarters of barley. What am I to do with it? "Grind it," said a malt-tax miser the other day. Yes, at a loss of 10s. per qr., or £75, in consequence of the £5 an acre tax. I can't malt it for my own use unless I pay the £5 an acre tax, although I employ during the harvest about 30 hands, who, when mowing, reaping, badging, or carrying, drink half a gallon of ale and half a gallon of beer each daily, a considerable portion of such ale and time being consumed in harvesting the said barley. By-the-by, the excisemen, who have now little to do, ought to be on the look-out, or the farmers will be out-of-door maltsters in spite of themselves. The said rural excisemen might fill up their time by gathering mushrooms for the supervisors. I mention this because such method appears to obtain among railway officials. A stranger was gathering mushrooms in one of our fields, and I asked him who gave him permission. He said no one; but his master often sent him out for an hour or two to gather mushrooms. "Who is your master?" "The railway over-looker." "Is he fond of mushrooms?" "Very." Do you, Mr. Editor, eat mushrooms and drink beer? I hope you do; but for the ease of a quiet conscience and stomach, do not steal one nor tax the other. Yours, &c., GEO. A. MAY.

Elford Park, 16th August.

## AGRICULTURAL PROGRESS IN AUSTRALIA.

Some statistical returns, prepared in the Australian colonies specially for distribution at the Dublin Exhibition, furnish us with many interesting details of their agricultural progress. Taking Victoria first as the most populous, and with an area nearly as large as that of the island of Great Britain—although as yet the population is only seven to the square mile—we find that the crown lands sold and granted in the colony from its first settlement to the end of 1864 amounted to nearly six million acres, the purchase-money realized being £11,690,000. The extent of land remaining inalienated at the same date was 49,735,948 acres, of which 28,826,756 acres were held under lease for pastoral purposes only by 1,161 occupiers, giving an average of about 25,000 acres to each occupier! The alienated land is nearly all in occupation. By the last return (to April, 1864) 17,679 holders were in possession of lots of over an acre in extent, the average to each being 314 acres. The same return showed that nearly three-fourths of the alienated land was enclosed, but that only an eleventh was under cultivation. The total extent cultivated was 507,798 acres, or less than an acre to every head of the population. About 149,000 acres were under wheat, 152,000 acres under oats, 8,000 acres under barley, 28,000 acres under potatoes, 96,000 acres under hay, 35,000 acres under green forage, and the remainder under minor crops. Owing to atmospheric influences, the last harvest was to a great extent a failure, but during the past ten years the average produce to the acre of wheat has been 20 bushels, of oats 27 bushels, of barley 23 bushels, of potatoes 2-four-fifths tons, and of hay 1½ tons.

The minor crops consist of maize, rye and bere, peas, beans, and millet, turnips, mangel wurzel, beet, carrots, and parsnips, onions, tobacco and vines. For the two latter, the soil and climate of Victoria appear to be well suited, although their cultivation has only recently begun to be much attended to. Tobacco during the last season covered 623 acres, and produced 5,913 cwt.; vines covered 3,076 acres, the produce of which was 121,000 gallons of wine, besides a large quantity of grapes otherwise disposed of. At some of the recent agricultural societies' shows in the colony the superior quality of the wheat this harvest is spoken favourably of, the prize-samples weighing respectively 67, 67½, and 68 lbs. the bushel, and the first-prize barley 60½ lbs.

There are now in the colony 110 flour mills, which last year operated upon 3,280,000 bushels of wheat, and produced nearly 70,000 tons of flour. The live stock in the colony, according to the returns for 1864, amounted to 103,328 horses, 126,786 milch cows, 548,486 other horned cattle, 7,115,943 sheep, and 79,655 pigs. All these descriptions of stock show an increase in the numbers returned in the previous year. Pigs seem particularly to be getting into favour, the number kept having doubled in five years, and sheep have increased in the same period by one million and a quarter. There seems a growing disposition in the colony on the part of yeomen to hold small flocks of sheep, by which a good income is to be derived with very little risk and with little chance of its being affected by the fluctuations in the market.

Any one securing a section of land, and having means to fence and till a portion of this, and as soon as it is fit to receive them, to put three or four hundred sheep on it, may consider himself independent. While new, and

in good heart, the land will produce enough to pay the expenses of tillage and of laying down a few acres each year under grass, while the keeping of sheep from the first under such a system as this will not only prevent any impoverishment of the land, but will actually improve it. After a few years of such treatment and the steady prosecution from the first of a plan for the preparation of it for sheep, a section of 640 acres should keep from 1,000 to 1,500 sheep, allowing 100 acres to be under crop each year, or less, if the distance from market be too great for the growth of agricultural produce. In such case, the produce of the tilled land may be entirely fodder for the sheep, and they will pay for what they consume quite as much as is obtained in ordinary seasons for grain or other crops, while the improvement of the land goes on, and it is each year rendered capable of carrying a few more. If the land is open, of good quality, and well watered in the first instance no very long time need elapse before it will be able to carry its three sheep to the acre, and a section in such condition will be a nice property for a yeoman and his family. But no one need expect to take up land, and do this all at once; for it is only land which has been tilled and laid down with the cultivated grasses that can support such a quantity of stock. A well-selected section should, however, keep a sheep to the acre from the first after being fenced in, and such a flock ought not only to support the owner and his family, but also assist besides in drawing out the latent capabilities of the land.

The wool exported in 1864, has been approximately returned by the customs at 39,407,726 lbs., valued at £3,247,128, which exceeds by more than a third that exported from Victoria in the previous or any other year. The tallow exports were 3,882,000 lbs., valued at £60,230, and the hides and skins valued at £102,684.

From the wheat statistics for South Australia we learn that the number of acres under this grain last year was 390,714, against 335,758 the year before, an increase of 54,956; but the total produce was only 4,250,868 bushels, against 4,691,919 the year before, a decrease of 441,056 bushels. Thus the average was only eleven bushels to the acre, a falling off of three bushels in comparison with the yield of the year before. The partial failures were sufficient to bring down the average much below that of the previous year, but the deficiency was scarcely expected to be so great as it is. The highest yield appears to have been that of the Mount Gambier district, 17½ bushels to the acre, while some portions of the county of Adelaide only averaged 6 and 7 bushels. The general average of 11 bushels to the acre is the lowest for the last five years. There will be, of course, a smaller surplus for exportation by the 441,056 bushels of wheat less, equal to 94,463 tons of flour.

From the statistics of Tasmania we learn that there has been a serious falling off in several important items. No correct returns of the wheat were to be obtained farther back than 1857; but in 1858 the quantity sent out of the colony was 226,268 bushels, which was exceeded by upwards of 4,000 bushels in 1861, while in 1864 the total export of wheat only amounted to 26,383 bushels. Thus, in three years, the export of wheat fell away to a tenth of what it was in 1861, the figures being for that year 230,398; for 1862, 182,193; for 1863, 98,524; and for 1864, 26,383 bushels. Nor was this compensated for in any way by an increase in the quan-

tity of flour sent out of the country, for this declined from 5,158 to 4,319 tons in the one year; but, in point of fact, more than the actual surplus was sold even then, for a considerable quantity of flour had to be imported before the end of last year, to meet the consumption of the inhabitants. The quantity of oats has also fallen off materially: from 546,590 bushels exported in 1860, the highest year of the series, to 187,800 in 1864, and the export of potatoes fell off in the one year from 12,615 to 10,509 tons, though this last quantity was still greater than had been exported in any former years. Fruit and jams alone showed an increase, in the former from 144,971 to 160,138 bushels, and in the latter from 7,450 to 21,670 packages in the year. The exhaustion of some portions of the land by bad farming, and the laying down of others in grass, would account for the great

falling off in the yield of agricultural produce, as it does not pay now to clear new land for tillage, and there is none in Tasmania fit for the plough without. But how are we to account for a falling off in the yield of wool? In 1864 there were 4,972,888 lbs., an increase on the year before; but the export in 1862 was 5,241,650 lbs., and in 1859, 6,107,903 lbs. The difference in the seasons makes some difference in the weight of wool grown; but the number of sheep must have decreased to effect such a change as this, while the flocks ought rather to have increased with the decline of tillage. Altogether, these tables show the state of affairs to be much worse than any one was prepared for in Tasmania, and that island has plainly lost for ever all claims to the title accorded her her twenty years since—that of the granary of the Southern Hemisphere.

## NORTH LINCOLNSHIRE AGRICULTURAL SOCIETY.

### MEETING AT MARKET RASEN.

This association has so grown with its growth that the more attractive parts of its annual exhibition—viz., its numerous and large classes of live stock—have become almost altogether unwieldy or unmanageable as an undertaking for a single day's show. With nearly 500 lots and pens of cattle, horses, sheep, and swine to be got into the yard, or rather fields, in the morning, and to be "judged" after 9 o'clock, the whole thing, to those who take ordinary business interest in it, is a continuous process of hurrying and scurrying all day, the end of which is no clear or defined opinion of the merit or demerits of any of the classes or the judging, unless one set is stuck-to to the end. To those who are officially or professionally engaged, the labour is something so excessive that it is impossible to get a complete and correct list of prizes by the expiration of the longest time that one's physique may be fairly taxed. On Thursday the judges had not awarded the prizes of several of the different classes till between one and two o'clock, p.m.; and in the case of the lighter breeds of horses, Messrs. Wood, Ellerby, and Atkinson had two classes to get through with after the chairman had taken his seat at the dinner-table, some time after the hour fixed, viz., three o'clock. The thoroughbred stallions were in the ring when grace before meat was said, and the roadsters had scarcely walked straight from the ring out of the show field when the noble chairman was giving the usual loyal and patriotic toasts. This delay, it may be at once fairly said, was no fault of the judges; for some of the horse classes were so good that it was a most difficult task to dispose of the single and large prize for a class which brought so many good animals together. Where two or three prizes are at the disposal of the judges, there is not so much delicacy felt as where a single declaration as to comparative merit has to be made. And no one who respects his own judgment, as well as that of many men who, it is known, are looking on, can jump to a decision in five or ten minutes, when four or five horses are so equally good that it must depend at last on the balance of taste and fancy, rather than judgment, as to which shall be the one presented with the single substantial favour. This is just how matters stood at Market Rasen in more classes than the one of twenty-two hunter-geldings and fillies shown for the prize of £50.

What are the conclusions that we can only come to, on the strength of the above observations? Why, simply that this association must drop its divisional distinction

of "North Lincolnshire," resolve itself into a county institution, pure and simple, and extend its annual meeting to two or three days. There is plenty of field-room in Lincolnshire for an important county association; and with Great Grimsby at the northern end, and Hull across the river, besides Boston, Stamford, and Grantham in the south, Louth in the north-east, the town so well known for its horse fair, Horncastle, more in the middle, and not forgetting Gainsborough and Brigg, in addition to the county town, there is ample scope for a migratory system of visitation quite large enough to make a meeting a novelty to the town and neighbourhood which may come in turn for the next meeting. This is the first secret of pecuniary success in county agricultural shows. The neighbourhood and districts within easy reach by road and railway were evidently in a state of general holiday-making on Thursday last, when about 10,000 entered the show-yard. This periodical drawing together of all classes has advantages so well known that they need not be here repeated; and the readiness with which people do meet when no opportunity occurs for it to be said, "I went last year, or two years ago, and I don't care about it this," is a sufficient guarantee that any reasonable investment in the portable shedding and water-proof roofing that may be required for night-protection would be amply repaid, pecuniarily, to say nothing of the increased and more serviceable impression that would be made on the minds of youths who are aspiring to agricultural success and honours, and particularly on the minds of townspeople, and outsiders generally, who now so often believe they have a thorough acquaintance with all the ins-and-outs of agriculture, both in its scientific as well as practical bearings.

In the midst of such helter-skelter and tip-toeing around the ring, to see the animals undergoing the authoritative scrutinizing process, there is no fair opportunity for that collected and instructive discussion which is so desirable; not, however, so much that farmers may be much improved in their art, as that townspeople and outsiders may be sufficiently instructed to know how to appreciate what is soundly as well as otherwise correctly done, according to the most reliable principles of economy. But as it is, the only conclusion that it seems generally come to is, that if such an increased collection of fine animals can be made, and such a large square of closely-packed machines can be pitched and set a-going, farming must be in a very much increased state of pecuniary prosperity, and that any cause but the right

one is given for, or supposed to exist in respect to, the difficulties under which agriculturists and consumers are now struggling in regard to every first necessary excepting corn. But if a two or three-day meeting took place, not only would many more of the townspeople among whom the meeting was held be able to pay their shilling or sixpence, but exhibitors and friends of exhibitors, and subscribers generally—in short all the practical attendants—would have a tenfold opportunity for giving correct information to classes who, in this respect particularly, prove the philosophy of Pope's opinion when he says, "A little knowledge is a dangerous thing." This argument applies to more societies than "North Lincolnshire," and to more results than we have pointed to; and as we have had a good opportunity for observing the amount of energy and pluck, as well as judgment in organisation, which is regularly displayed by Lincolnshire men at fairs and ram sales, we have not the slightest doubt but that steps will be at once taken to remedy the shortcomings pointed at as regards an effective and impressive—correctly impressive—agricultural exhibition; and by another year a meeting will be organized that will be worthy of their great and well-cultivated county, of their good horses, of their fine Shorthorns, their long and lustrous wool, and therefore of themselves as good men of business.

The Shorthorns were a large and good show, a number of them being excellent, both for size and proportion of flesh to bone; while there was nothing to complain of on this occasion about the vigour and hardiness of the animals being on the decline from excessive feeding and pampering. The prize of £30 for the best bull so offered that it could be competed for with animals outside the county, and it took in all the other classes above a year old. It was awarded to Lord Pam, 8 years and 6 months old, sire Lord Clyde; and, as will be seen by the prize-list below, he came from Yorkshire. He is a very heavy-fleshed and thick-set kindly red roan. Mr. Sharpley's Lord Panton, a four-year-old, and bred by Mr. Dudding, is a very long and heavy-fleshed animal, with great fore-quarters and well-arched ribs, and his back is unusually true, considering his length. Mr. Brown's Masterman, which took the premium in the three-year-olds, has a wide straight back and great loin, is very fleshy, stands on short legs, and carries a neat head and horn. In the two-year-olds, Mr. Middlebough's Prince of Wales, which competed in class 1, is an extra-good light roan, with perfect hind-quarters, great shoulder, and heavy but neat neck; the only thing required to make him of an A 1 stamp, being a middle that, for one so good generally, is singularly weak just where the tape goes. Mr. White's Baron Blencow sire Royal Windsor, is a neat and smart silvery white. Mr. Brand's red and white nine-months-old calf Mohawk, sire Knight Errant, is wonderfully good in his fore-quarters, brisket, and shoulder, and carries the finest possible head, with a long tapering nose. If a bovine strippling could be relied on for certainty in regard to the promises he makes, as this young gentleman has, in addition to that fine stylish movement which gives a favourable impression even with animals produced for food, we might predict with confidence that he would make a considerable mark at future shows. Mr. Foljambe's Duke of Windsor was second, and, at eleven months old, would nearly make two, in appearance, of the first; but in Duke of Windsor there are many indications that he will grow "raw-boned" with size, and otherwise unlike, particularly about his head and horn, a prize-taker in good company. Messrs. Dudding's Colonel Tuck, by Prior Tuck, is a good long, straight backed, fleshy, and otherwise promising calf.

The females were preceded by Mr. Torr's Gracious Princess, which took the first prize in the cow class; and

she is a fine fashionable roan, with deep, heavy fore-quarters, and a tapering neck, and fine head and horn. Mr. Hutton's Pearl was also very handsome. Mr. Lynn's Pamela is an extraordinarily fat-natured and well-fed symmetrical heifer, which promises much better for a good position at Bingley Hall or Lalington, than for a good character as a breeder. Mr. Lambe's first yearling is a heifer with great substance; Mr. Foljambe's silky-coated roan was a picture to look at; and Messrs. Dudding's second promises to be of great size and width, as well as full of heavy flesh.

The pens of Leicester sheep were only six, but Mr. Borton's prize was a good firm-backed curly and lustrous-coated ram; and Mr. Marris' No. 70 had an excellent back and good "skin," while his pen of ten ewes were worthy of the £10 prize, although they stood in their smartness alone.

In the classes of "Long-wool sheep, not being Leicesters," it was often difficult to tell where Lincolns began and Leicesters left off. However, the character of the Lincolnshire sheep, as it was found many years ago, before turnip-growing and folding were generally practised, stood in the same relations to modern notions and necessity for quick returns, as the Norfolk black-faced and the big coarse-headed Hants sheep did to the more compact and docile Southdown. If the Leicesters have in many cases degenerated into smallness and fineness with thin light coats, and the Southdown has, under similar treatment of in-and-in breeding, become too small for profit, there cannot be a question raised about the fact that all our improved and most valued modern flocks owe their superior qualities—the long-wools to the Leicesters, and the short-wools to the Southdowns—to the way in which long and rambling crooked frames have been toned down and brought into shape by these more distinct breeds.

Looking at the show of sheep at Market Rasen from these points of view, we were glad to perceive there were growing opinions in favour of stock sheep being as mathematically true in form as it is possible to get them; for if there is a limit to the size of sheep, it is folly to attempt to grow donkeys in sheep's clothing, as this attempt at unnatural development will be sure to result in flat ribs, warped spines, and legs that drag behind the tail, instead of being actively and firmly lifted in a correct position beneath the carcass they are intended to support and carry.

It may be here appropriately asked, What is the advantage to anybody of attempting to produce extraordinarily large frames, as a rule? It is true, some large joints of mutton are wanted for certain purposes and on certain occasions; but if a large breed of sheep be kept up, there will always be enough extraordinary off-shoots from a flock to supply the demand for great legs and saddles; and there cannot be two opinions among men of experience in regard to the difference in profits from a flock when symmetry is made the first object and size the second, and where size is made the main aim and symmetry and well-balanced frames left more to chance. Another point may be here touched upon. If there be any truth at all in scientific conclusions—and no one can doubt it, if he has weighed these mental results with practical tests and calculations—an acre of roots or green food and so much corn would be worth so much for producing a crop of mutton. If, say, two cwt. of guano and two ditto of superphosphate would produce so many tons of turnips, the food so produced would yield so much live mutton,—supposing the sheep were equally healthy and thrifty—whether they were of a naturally small or large size. No man will argue that a Hampshire Down does not eat more, and exhaust the land more, than a Southdown. By the same rule, a neat Leicester and an exaggerated Lincoln differ in their consumptive and exhaustive characters. For these further reasons, we repeat that the whim, or

fashion, or opinion which now regulates the actions of some breeders and feeders is, on the ground of economy and profit, almost altogether a mistaken one. It is quite true, if sheep for sheep be taken, a 35lbs. per qr. one would be worth more than one weighing 25lbs. per qr. But, then, the points arise about fecundity and capacity to rear, as well as about the weight of produce (other things being equal), depending on the quantity of food that goes into the mouth and stomach. For these reasons, we again repeat that we were pleased to see the increased tendency on the part of the judges and spectators, in favour of true frames and straight, stiff legs; and we have no doubt but that these views will have grown more general by, and be further demonstrated at, the large sales of Lincoln rams which will shortly take place.

After these general remarks, we will not make any critical comments on individual sheep, further than to say that Mr. Lynn's second-prize two-shear had a Leicester ancestor, on one side or the other, not many generations back, and that this stamp of sheep, and the other similar ones in the yard, were undoubtedly to be preferred, both on the score of economy of food and the direct profit they would yield by the weight of mutton and wool produced. Mr. Edward Davy's pen of ten were fine old ewes; as Mr. H. Grantham's gimmers were very beautiful and uniform in size, frame, and wool; while Mr. Lister's were regular and neat in size, but not so true in character. Mr. Young's she lambs were a capital pen of ten, and Mr. Edward Davy's were a good second to them.

The pigs were much less numerous than these animals usually are in counties where more dairying is done. Among the large boars there were, however, some excellent specimens. The combination of size and quality, as exemplified in Mr. Duckering's fine two-year-old hog, fairly admits of its being pronounced a first-class animal; whilst Mr. Dyson's enormous hog, at the age of 2 years and 6 months, was as fine a quality as could be expected in one of his size. It may be mentioned here that a modern agricultural show-yard does not require the same class of attendants as the rings of olden times, when bull-baiting was popular, probably did. This we name because it is equally important to the owner of stock and the public that men given to sobriety and respectful address should be placed in charge of animals exposed for public inspection; and a more unmitigated and unwarranted display of ruffianism, excepting that no blows were exchanged, than was made by a man professing to be in charge of one winning exhibitor's pig, we never saw. The regular attendants of an agricultural show-yard do not need the full force of Leeds back-slums bullyism to draw or enforce rules for the inspection of animals; and the less scrupulous spectators, if they exceed the bounds of reason in touching an animal, can be checked without the use of that coarseness of speech and manner to which it is to be hoped even the mining districts around Leeds are strangers. Mr. Graham's young boar of the small breed was very fine and neat; and Mr. Thornton's was a good second here. In the other classes there was nothing below mediocrity and not much above it.

The horses as a whole were undoubtedly the best for form, quality, and size according to their classes, that we ever saw at a county meeting; and, as Mr. Jacob Wilson said, in responding to the toast "The health of the Judges," the Market Rasen collection has undoubtedly surpassed this department of the show at Plymouth. As regards numbers too, we find there were only six more at the Royal than at the North Lincolnshire meeting—the number at the former having been 193, and at the latter 187. These facts alone are enough to justify the opinion we have above expressed about the farcical performance comprised in bringing so many animals together to be before the public only seven hours, during which

time all the interest of judging, private comparison, and philosophic examination have to be got through with, or rather that impossible feat attempted.

The result of our record of the first class to which we have to refer, will be some further confirmation. A prize of £20 was offered "For the best thoroughbred Stallion for Hunters." These were brought before the judges after 3 o'clock, and while they were deliberating we went to the next field to pick up a few stray late awards, which we had not secured, and when we came back the ring was cleared, and the horses had "left the field and gone," while at the same time no opportunity was allowed for us to get the award; therefore in this particular our readers must be content to wait till next week. This, however, is not much loss: indeed, as we perceive a local contemporary was in the same difficulty, perhaps the prize was withheld for want of merit.

In the draught horses, Mr. Warburton's Splendour, a seven-year-old iron grey, is an immensely powerful, well-balanced and good-looking horse. Matchless and Farmer's Glory are also great and good bay horses of the Lincolnshire size and stamp. This was a good class. In the roadsters, Mr. Bromby's Phenomenon looked well for compactness and general appearances, while his style and activity were equally commendable. Another of the same colour, a bay roan, Young Quicksilver, is a leggy and light-barrelled two-year-old, and promises to grow out of a roadster's height as well as general character.

Among the mares for breeding hunters there were two to redeem the otherwise poor character of the long string of twenty-two entries. The first prize is a twelve-year-old bay, of great power and good appearances, her quarters being roomy as well as correctly formed, and her temperament—an important element—undoubtedly courageous as well as docile. The second, Mr. Fieldsend's, is what may be termed a perfect model—*within herself*. This, in addition to the fine condition she appeared in, adding to her natural beauties of form and features, made many spectators inclined to think the judges had committed a great mistake. But in our opinion they displayed great soundness in over-looking the fine quality and brilliant appearances generally of the dappled bay, in favour of the more roomy first prize. This was a class for breeding hunters, therefore the question of the probable issue had to be taken into consideration; and if there be any soundness in the theory—that the best sire for hunters is a stout thorough-bred horse, why it would have been a weakness to have reversed the decision in favour of the fine quality and beauty of Mr. Fieldsend's mare. For these very elements, in addition to the second mare not having an ounce of bone to spare, would give the great probability that her issue, if by a thorough-bred sire, would be weedy "tits" or a lady's Rotten-row canterer. If the two animals had been before us as *mares for hunting* we should unhesitatingly have given the more elegant bay the preference; but as they were in competition as *mares for breeding hunters*, we as readily agreed with the judges' decision.

The other more important classes, which were brought together by premiums offered by gentlemen in the county, were of a very interesting character. There were nine five-year-old hunting mares and geldings in competition for Lord Yarborough's £10 premium; and Mr. Lacy's black roan, which took it, has fine qualities, including a good style of moving, combined with great power and general good appearances. We were informed this horse was bought by Mr. Collins, of London, at a long figure. Mr. Hobbs, of Stainton Hall, Caistor, had in this class a nice-topped short-backed gay cheanut gelding. In the hackneys not exceeding 14 hands 2 inches the most attractive one was Mr. Frankish's perfectly-formed light



mare, of a beautiful quality, and a style of moving not to be surpassed; but the favour was conferred on one with more size and substance. Mr. Olding's was a good brown cob; but being therefore out of his class, he was "no where."

The class of the day, however, was formed of the twenty-one hunting geldings and fillies, four years of age, mustered in response to the handsome £50 premium offered by Mr. Henry Chaplin. There were twenty-two entries, but Mr. James Hornsby's chesnut gelding became alarmed, after entering the horse-box, at Grantham, and in plunging threw himself, from which he was sufficiently put out of trim to prevent his making an appearance. Two of the London prize horses were there; Mr. Clark's chesnut, Cotton Stockings, and Mr. Percy's Cumberland Bay; but neither of these was more than commended, although they were among the five between which the single substantial award lay. We certainly never saw five better animals standing together, and we should have been equally satisfied whichever one might have received the honour; for, as we have observed above, it must have come at last to a balance of taste and fancy, and not to a decision from superior excellences or one or more palpable comparative defects. Mr. Clark, who had four entered, had his bay gelding among the five, and he was also commended. Mr. Jewison's brown gelding was also in this lot, and therefore commended; and we were afterwards informed on good authority that he was sold to Sir John Trollope for 250. The class, as a whole, was a most excellent one; but there were one or two that were altogether out of place. One from Ulceby, a bay gelding, will make a good single carriage horse for large parties who may prefer long rides to pace; and one from Newark, a bright bay, and also a gelding, but whose colour was more lustrous than his other appearances, for with his linen-prop legs, cow thighs, and other defects and uglinesses, it would be difficult to tell where he would be in his proper place. The premium was given to Mr. Jackson Everett, Park-an, Doncaster, for his excellently-formed and stylish bay gelding.

The roadsters not exceeding 15½ hands were the last class, and an excellent one it was, giving the judges some difficulty to come to a satisfactory decision. Mr. Thornton, of Lincoln, had three in this class, two of which were very smart—one a black mare, with excellent appearances for quick, light work; and the other a very clever brown gelding, with great working traits. The judges, however, were inclined for more substance, and the award lay between Mr. Wakefield's very beautiful roan, with very fast and good action; and Mr. West's very powerful six-year-old brown mare, but which was more of a hunter animal than the roan. The premium, however, went to Mr. West.

## PRIZE LIST:

### CATTLE.

#### SHORTHORNS.

JUDGES.—Wm. Carr, Stackhouse, near Settle.  
John Painter, Forest-row, Nottingham.  
J. Wilson, Woodhouse, Morpeth.

Bulls above one year old.—Prize, £25, J. R. Middlehough, South Milford, Milford Junction.

Bulls three years old or upwards.—Prize, £8, Percira Brown, Gwentworth, Lincoln.

Two-year-old bulls.—First prize, £10, J. R. Middlehough, Second of £4, John Charlesworth, Headfield, Dewsbury.

Yearling bulls.—First prize, £10, Elam Cartwright, Waleaby, Raseen. Second of £4, Benjamin Wass, Worlaby, Brigg.

Bull-calves under a year old.—First prize £5, G. Bland, Coleby Hall, Lincoln. Second of £3, G. S. Foljambe, Osberon Hall, Worksop.

Cows more than four years old, having produced a calf at

its natural time, within nine calendar months of the time of showing.—First prize, £8, W. Torr, Aylesby Manor, Grimsby. Second of £4, Wm. Hutton, Gate Burton, Gainsborough.

Heifers, three years old, having produced a calf at its natural time.—First prize, £7. Second of £3.—No entry.

Two-year-old heifers.—First prize, £6, John Lynn, Stroxtan, Grantham. Second of £4, Wm. Torr.

One-year-old heifers.—First prize £6, Wm. Lambe, Aubourn, Lincoln. Second of £4, George Bland. Third of £2, Herbert Salt, Methley Park, Leeds.

She-calves under one year old.—First prize, £4, G. S. Foljambe. Second of £2, Messrs. Dudding, Pantton House, Wragby.

### COTTAGERS' PREMIUMS.

Milch cow, having produced a calf within nine calendar months of, and in milk at the time of showing, the property of a cottager or mechanic occupying not more than ten acres.—First prize £4, William Kirk, Stainfield, Wragby. Second of £2, Edward Richardson, Hainton, Wragby.

### SHEEP.

#### LEICESTERS.

JUDGES.—L. Borman, Irby, near Grimsby.

J. B. Slater, Cammeringham, near Lincoln.

Rams of any age.—Prize, £10, John Borton, Barton House Malton.

Pens of ten ewes or gimmers, the ewes having suckled lambs up to the 10th July.—Prize, £10, Thomas Marria, Ulceby Chase, Ulceby.

#### LONG-WOOLLED (not being Leicesters).

JUDGES.—R. Johnson, Westthrough, Grantham.

E. Lythall, Radford Hall, Leamington.

Harwood Mackinder, Spilby.

Rams of any age.—First prize, £15, John Lynn, Stroxtan, Grantham. Second, Charles Clarke, Scoopwick.

Shearling rams.—First prize, £10, Robert Wright, Nocton Heath, Lincoln. Second of £6 and third of £3, William Collingwood, Fulbeck, Grantham.

Two-shear rams.—First prize, £8, Henry Grantham, Sturton, Brigg. Second of £3, Messrs. Charles and John D. Lister, Coleby Heath, Lincoln.

Pens of ten ewes, having suckled lambs up to 10th July.—First prize, £8, Edward Davy, Thoresway, Caistor. Second of £3, Mr. Ealand, Aisthorpe, Lincoln.

Pens of ten shearling ewes or gimmers.—First prize, £7, H. Grantham, Sturton, Brigg. Second of £3, Messrs. Lister, Coleby Heath, Lincoln.

Pens of ten she-lambs.—First prize, £5, J. J. Young, Claxby, Raseen. Second of £2, Edward M. Davy, Thoresway, Caistor.

### HORSES.

#### AGRICULTURAL.

JUDGES.—J. Brooks, Grimsby.

R. G. S. Howard, Lincoln.

T. Plowright, jun., Pichbeck, palding.

#### HIDING HORSES.

JUDGES.—W. S. Atkinson, Woodlesford.

T. Ellerby, Whitwell, near Malton.

J. Wood, Market Overton, Rutland.

Stallions for draught horses.—First prize of £15, W. Warburton, sen., Sturton, Retford; second of £5, William Duckering, Topholme, Wragby.

Stallions for roadsters.—Prize of £8, John Bromby, Alkboro', Brigg.

Mares for breeding hunters, with a foal at their heels.—First prize of £8, Charles Burkinshaw, Benniworth, Wragby; second of £3, John S. Fieldsend, Stainton-le-Vale, Market Raseen.

Mares for breeding draught horses, with a foal at their heels.—First prize of £8, Messrs. Lister, Coleby Heath, Lincoln; second of £3, William Tennant, Barlow, Selby.

Mares for breeding roadsters, with a foal at their heels.—First prize of £6, J. Coupland, Hemswell Cliff, Kirtton Lindsey; second of £3, Rev. W. Jenkins, Fillingham Rectory, Lincoln.

Mares for breeding carriage horses, with a foal at their



heals.—The prize of £6, J. G. Little, Blyborough, Kirton-in-Lindsey.

Hunting fillies, two years old.—Prize of £5, J. J. Young, Clarby, Market Rasen.

Hunting fillies, one year old.—Prize of £4, W. E. Hobson, Kettlebythorpe, Brigg.

Cart fillies, three years old.—Prize of £5, James Greenhouse, jun., Blankney Fen, Lincoln.

Cart fillies, two years old.—Prize of £4, James Cook, Kingerby, Rasen.

Cart colt foals.—Prize of £3, Anderson Kay, Glentworth, Lincoln.

Cart filly foal.—Prize of £3, R. G. F. Howard, Temple Bruer, Lincoln.

#### PREMIUMS OFFERED BY GENTLEMEN.

By the Right Hon. the Earl of Yarborough, President: Hunting geldings or mares, five years old, the pedigrees to be taken into consideration, £10—William Lacy, Panton, Wragby. Hunting geldings or mares, three years old, by a thorough-bred horse, the pedigree (if any) of the mare to be taken into consideration, £5—Richard Mason, Keddington, Louth.

Hackney geldings or mares, not exceeding fourteen hands two inches in height, given by J. B. Stanhope, Esq., M.P., £5—Richard Milwall, Thurgarton Priory, Southwell.

Pairs of draught horses, not less than four years old, mares and geldings only eligible (by J. B. Stanhope, Esq.), £5—George C. Woodhouse, Wellington, near Lincoln.

Hunting geldings or fillies, four years old, substance, and especially pedigree, to be taken into consideration, given by Henry Chaplin, Esq., £50—Jackson Everett, Park-lane, Doncaster.

Hunting foals, by a thorough-bred horse, the pedigree (if any) of the mare to be taken into consideration, given by Edward Heneage, Esq., M.P., £5—Joseph Danby, Hibaldstow, Kirton-in-Lindsey.

Roadsters, not exceeding eight years old, nor fifteen-and-a-half hands in height, to carry sixteen stones, the quality of the animal being particularly taken into consideration, given by the Rev. Basil Berridge, £5—John West, Melton Ross, Ulsby.

#### PIGS.

JUDGES.—As for Leicesters.

Boars of a large breed.—First prize of £5 to Mr. R. E. Duckering, Northorpe, Kirton-in-Lindsey. Second, £3, Mr. John Dyson, Leeds.

Boars of a large breed, not exceeding twelve months old.—First prize of £3 to Mr. John Dyson, Adelphi Hotel, Leeds.

Boars of a small breed.—First prize of £4 to Mr. C. W. Graham, York-road, Leeds. Second, £2, Mr. L. T. Thornton, Lincoln.

Boars of a small breed, not exceeding twelve months old.—First prize of £3, Mr. C. W. Graham, York-road, Leeds.

Sows of a large breed, having had a litter since 1st March, 1865.—First prize of £4, and second prize of £2, to Mr. R. E. Duckering, Northorpe, Kirton.

Sows of a small breed, having had a litter since 1st March, 1865.—First prize of £4 to the Rev. B. Snow, Burton, Pedwardine, Sleaford. Second, £2, Mr. L. T. Thornton, Lincoln.

Three breeding pigs of the same litter, not exceeding six months old, of a large breed.—First prize of £3 to Mr. R. E. Duckering, Northorpe, Kirton.

Three breeding pigs of the same litter, not exceeding six months old, of a small breed.—First prize of £3 to Mr. John Lynn, Stroxtan, Grantham.

There were also some other extra and special prizes given for stock, poultry, and wool.

#### IMPLEMENTS.

The entries under this head numbered 736 articles, and a very great show they made. The trade, however, as it has been, we regret to say, throughout the year, was pronounced to be "not first-rate." As no prize list of the

implements was obtainable, we must be content with giving merely the names of the exhibitors and mentioning the sums offered as prizes. For reaping-machines of various kinds £54 in six prizes were offered by the society, but they have not yet been brought to trial. Hornsby's machines, although entered, were not on the ground, from some unaccountable delay of the Railway Companies, between Market Rasen and Plymouth, the Royal machines having been depended on for this show. There were also twenty-eight other prizes, amounting to £80, on offer, with £20 in addition placed at the disposal of the judges for distribution as they might see fit. These awards we will give with the decisions over the reapers, which will take place in a few days. The Tuxfords and Clayton and Shuttleworth trusted to local agents for any exhibition of their implements. Amies and Barford, with their more general manufactures and collection, made a great show with 40 different articles, many of them being effectively displayed in motion. Coultas, of Grantham, had several drills and hoes; for one of the former, for general purposes, we happened to see he was awarded the £4 prize. Richmond and Chandler also appeared, whom we also chanced to see were awarded the prize for chaff-cutters. Bentall, of Heybridge, Esser, had a large stand of machinery, with which a call was made here, on the road to Doncaster for this week. Hebb, of the Foundry Company, Market Rasen, and Hornsby, of Grantham, had a collection of ploughs of various sizes, and a steerable horse-hoe. The other manufacturers were Ashby and Jeffery, of Stamford, who had a large stand of their well-known articles; Ashley, of Louth; Ashton, of Horncastle; Barton, of Great Grimby; Benson, of Sturton; Cannon, of Louth; Chapman, of Omby; Bradford, of washing-machine celebrity; Brigham and Bickerton, of Berwick-on-Tweed, showing reaping machines, &c.; Dickinson, V.S., of Boston, non-poisonous sheep-dipping mixtures; Clark, of Lincoln, drills and other articles; Marshall and Co., of Horncastle. Besides these there were many other Lincolnshire village manufacturers; for this county is famous for its numerous and skilled local machinists. There were also a large number of agents on the ground; so that there is no fear of Lincolnshire being henceforth looking up and being well supplied with machinery.

#### THE ANNUAL DINNER

of the society was held in a marquee, in a paddock belonging to Mr. Goodson, of the White Hart, by whom a good dinner was provided, and served in a satisfactory manner. The president of the society, the Earl of Yarborough, occupied the chair.

So far as the speechifying went, it could not be expected that the minds of the country gentlemen would have settled down to home affairs so soon after a general election, and although politics are prohibited at this society's meeting, there is a way of closely shaving the teeth of the wind, which was done on this occasion, but in a very pleasant way, which indeed was unusually so, because brevity was the order of the day.

The Stewards of the yard and other officials, so far as we could see, did the best they could to make everything pass off pleasantly under the difficulties mentioned. One good idea, which was as courteous as it was happily hit upon, we must not forget to mention, as it may be followed perhaps with advantage in other small towns, where, on similar occasions, a large influx of visitors may take place. The Rev. F. R. Pentreath, Master of the De Aston Grammar School, placed at the disposal of the Stewards the many beds that nearly forty students require during term time. Thus, by the rev. gentleman's consideration and forethought, several visitors who arrived late at night were, with the help of his obliging and amiable lady, able to rest in comfortable quarters, when they would otherwise have had to sit in a corner, or sleep—that is, the weather being considered, lie two or three in a bed.

## THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

A CATALOGUE OF THE AGRICULTURAL IMPLEMENTS, &c., EXHIBITED AT THE  
PLYMOUTH MEETING, IN 1865.

**ALLCHIN AND SON, Northampton.**

Seven-horse portable steam-engine £230, grinding mill £50, screw jacks 25s.

**ALLCOCK, T., Ratcliffe-on-Trent, Notts.**

Horse hoes 45s. and 65s., grubber 75s., horse rakes £7 10s. and £8, carriage jack 25s.—Commended for horse-rake.

**ALLEN, E. E., 40, Parliament-street, London.**

Twelve-horse double expansive portable steam engine £330.

**AMIES, BARFORD, AND CO., Peterboro'.**

Lead rollers £8 10s. to £24, garden rollers 70s. to £8 10s., steaming apparatus £14 to £26 10s., sack barrow and elevator 7s. and 9s., corn mills £20 and £27, four-horse portable steam engine £160.

**ARNOLD AND ARNOLD, Plymouth.**

Drilling machine 8 gs., pedomotive grindstone 60s., Gardner's double-acting turnip cutter £5 10s., oat crusher and bean splitter £5 15s., chaff cutters 45s. to 84s., machine made galvanized netting from 4d. per yard, Lloyd's flour mill and dressing machine £6 15s., compound-action butter churns from 7s. 6d. to 85s., and sundries.

**ASHBY AND JEFFERY, Stamford.**

Haymaking machines 11 to 16 gs., horse rakes £7 10s. to £10, wheel hand rake 40s., chaff cutters 50s. to £14, oilcake mills 65s. to £6, 4-horse portable steam engine £135, eight-horse ditto £320, thrashing machines—four to five-horse £65, six to eight-horse £95, one-horse gear works 8 gs., rotating harrows 70s. to 6 gs., steel crank shields 12s. 6d. and 15s.—Commended for set of patent steel crank shafts.

**AVELING AND PORTER, Rochester.**

Agricultural locomotive engines—eight-horse £360, ten-horse £420, travelling rope porters 60s.

**AVERY, J. G., 185, Regent-street, London.**

Tubular churns (three specimens) 4 gs., 5 gs., and £7 10s.—Awarded silver medal for "Jebbe" tubular churn.

**AVSFORD, T. B., Fulham.**

Dog cart £25, other carts 28 to 30 gs.

**BADGER, J. AND W., Worcester.**

Sets of diagonal lock-beam harrows 50s. to 80s., ditto scuffle drags 95s.

**BAKER, JOHN, Ipswich.**

Combined blowing and dressing machines (six specimens) £9 10s.

**BAKER, T., Compton, Berks.**

Portable cylindrical liquid manure carts £20 12s. and £24.

**BALL AND SON, Rothwell, Northamptonshire.**

Combined drill and presser £25, waggons £30 and £35, carts £14 to £16, horsehoes £2 12s. 6d. to £7 10s., horse rakes £8 and £8 10s., grubber £3 10s., scarifier £6 10s., harrows £4 10s., various ploughs £3 15s. to £4 10s., Clarke's patent scythes 26 per dozen.—Awarded second prize of six pounds for pair-horse wagon, and third prize of two pounds ten shillings for single-horse cart.

**BAMLETT, A. C., Thirsk.**

Two-horse mowers £26 and £22 10s., one-horse mower £22, reapers £25 to £32, one-horse reaper £20, combined mowers and reapers £26 and £32.—Awarded third prize of five pounds for combined mowing and reaping machine.

**BARBER, D. H., King-street, Liverpool.**

Mower with flexible finger-bar, £22, two combined mowers and reapers £26.—Commended for combined mowing and reaping machine.

**BARNARD, BISHOP, AND BARNARDS, Norwich.**

Noiseless lawn mowers £2 10s. to 28s.; garden and park chairs, stools, and seats, 8s. 6d. to £2 15s., garden tables £1

2s. 6d. to £1 10s., galvanized wire netting 4½d. to 2s. 3d. per yard.

**BARROWS AND CARMICHAEL, Banbury.**

Portable steam engines—6-horse £200, 3½-horse £100, thrashing machine £70, finishing £105.

**BAYLISS, JONES, AND BAYLISS, Monmore Green, Staffs.**

Sundry hurdles 4s. 11d. to 18s. 3d., and 4s. 6d. per yard; continuous fencing 1s. 9d. to 2s. 11d. per yard, and self-shutting handgates £2 and £3, footpath gates £1 18s. 6d. to £2 12s. 6d., other gates £1 5s. to £1 16s., tree guards 16s. to 19s. 6d., self-relieving chain harrow £3 18s., garden stool and chairs 4s. 6d. to 17s.

**BEACH, J., Dudley, Worcestershire.**

Farinaceous food for cattle £1 5s. per cwt., meal for milch cows 15s. per cwt.

**BEARE, H., Liverton, Devon.**

Combined thrashing machines £13 10s. to £55, portable gears 7 gs. to £16, intermediate motion £3 chaff cutter 8 gs., turnip and mangold drill £9 10s.; combined sawing, boring, and tenoning machine £22; winnower £7 10s., cled crusher £9.

**BENSON, MARTIN, St. Dunstan's Hill, London.**

Pumps various £1 to £16 16s. 4d., fire and farm engine with hose complete £25 2s. 3d.

**BENTALL, E. H., Maldon.**

Chaff-cutters £2 5s. to 8 gs., root pulpers £3 18s. 6d. to 7 gs., turnip cutters £4 5s. to £5 17s., oilcake mills 3 gs. to 6 gs.; corn and seed crushers 5 gs. to £10, two universal mills 5 gs., two oat kibblers 3 gs., bean mills £2 12s. 6d. to 3 gs., two-horse gears 8 gs. and 10 gs., with intermediate motions 8 gs., broadshares 5 to 7 gs., and horsehoe £2 14s. 6d.

**BEVERLEY IRON AND WAGGON COMPANY.**

Liquid-manure distributors £17 and £22, watering apparatus £1 10s., portable pumps £5 15s. and 7 gs., three-horse reaper £42, two-horse reaper £27, waggons £29 10s. and £33, carts from £13 10s. to £17, cartwheels with axles £5 to £15, clodcrushers £18 10s., plain roller £15 10s., compound action mill £20.—Awarded first prize of ten pounds for pair-horse wagon, third prize of two pounds ten shillings for two-horse cart, first prize of four pounds ten shillings for harvestcart, second prize of four pounds for market cart on springs; highly commended for "other waggons," for single-horse cart, and for market cart on springs.

**BISSELL, W., Wolverhampton.**

Vertical saw frame and engine £88, circular-saw bench £27, morticing machine £14 10s., combined planing machine £100, tenoning machine £50, lifting jack 80s., bench cramp 28s.

**BLACKBURN, R., Exeter.**

Traction engine and steam cultivator £350.

**BLINKIRON AND HILL, Spalding.**

Double-acting force pump or fire engine £19 10s. to £47. 10s., farmer's force pump £35, hand fire engine £9, village fire engines £20 and £75, six lift pumps 21s. to 50s., and garden engines 30s. to 50s.

**BOBY, R., Bury St. Edmunds.**

Haymakers £14 and £14 15s., screeners and dressers £15, self-cleaning corn screens 7 to £15, gravel or lime sieve 4½s. 6d. to 67s. 6d., malt screens 25 and 6 gs., sample screen 35s., barley hummeller £5.—Awarded third prize of four pounds for haymaking machine.

**BOWDEN, J., Chagford, Devon.**

Horsehoe 50s., horse rake £9, two-horse cultivator £6 10s., iron plough £5 10s.—Highly commended for single-row horse hoe on ridge and flat, and for single-row grubber.

**BOWHAY, J. L., Modbury, Devon.**

Corn drill £20 10s., seed and manure drill 16 gs., manure distributor 14 gs., grassmower £22 10s., reaper with manual delivery £24, combined reaper and mower £30, horsesakes 65s. and 70s., machine cart 10 gs., two-horse gear 8 gs., one-horse gear 6 gs., intermediate motions 3 and 6 gs., chaff-cutters 50s. to 6 gs., corn crushers 6 gs. and £8 10s., flour mill £6 10s., root pulpers £5 to 7 gs., turnip cutter 90s. and £5 10s., pair of rakes 9s. each, sheep rack 3 gs.

**BRADFORD, T., 63, Fleet-street, London.**

Variety of washing, wringing, and mangling machines 25s. to £45, three-roller mangle 90s. to £6 10s., new box mangle £11 10s., churns 40s. to £6 10s., butter-makers 21s. to 63s., cinder-sifter 15s. and 21s., and high-pressure vertical steam-engine.

**BRAGGINS, J., Banbury.**

Park gates and posts £15 10s., lodge gate 60s., entrance gates 50s. and 40s., field gate 27s. 6d., road gate 20s.

**PRENTON, W., Polbathie, Cornwall.**

Turnip drill 15 gs., ditto one-row £7, manure distributor £11, two-horse reaper with revolving cylinder £23, one-horse reaper £21, horsesake 45s., tubular whippetrees 10s. and 18s. 6d.

**BRIDGES, H., 406, Oxford-street, London.**

Dairy articles 1s. to 10s.; impressions from butter prints.

**BRINSMEAD, T., St. Giles-in-the-Wood, Devon.**

Synchrocal thrashing and reed-making machines £5 10s. and 8gs., self-exercising and nursing chairs 20s. and 30s.

**BRITISH SEWING MACHINE COMPANY, 71, Oxford-street, London.**

"Alexandra" elliptic lock-stitch 7 to 28gs.

**BROWN, B., 43, Oakley-street, Lambeth.**

Samples of the steel spring lever oil lubricators 1s. 6d. to 7s., vermin exterminator 1s. per box, fibrine meal cake for dogs 1s. per bag, concentrated poultry food 1s. per bag, dairy scales and glass weights and rosettes, the latter 1s. 6d. to 2s. per pair.

**BROWN AND MAY, Devizes.**

Portable steam-engines—8-horse £220, 24-horse £75, combined thrashing machine £55, 4-horse "Cannon" pumping engine £235.

**BUCKINGHAM, JAMES, Bathpool, Cornwall.**

Butterfly ploughs £5 10s. to £6 7s. 6d., turnshare plough £4 10s., cultivators £8 10s. to £11 5s.

**BULLEY, R. B., Station-road, Plymouth.**

Landau sociable £130, barouche £85, park phaeton £40.

**BUNCE, J. S., Plymouth.**

Longcloth shirts 77s. 6d. to 112s. per dozen, dress shirts 98s. each, spun silk shirts 15s.

**BURGESS AND KEY, Newgate-street, London.**

Mowers £18 to £25, self-raking and swathe-delivery reapers £28 to £40, combined reaper and mower £28, centrifugal pump £24 10s., water lift £40, sack truck 18s., liquid manure pumps £3 15s. to £26 10s., mincing machines 12s. 6d. to 3gs., cask tilts 10s. 6d. to 16s., garden seat one guinea, garden table one guinea, American churns 40s. to 50s.—Highly commended for grass mower.

**BURNARD, LACK, & Co., Plymouth.**

Concentrated superphosphate of lime.

**BURNEY AND CO., Millwall, London.**

Liquid manure and water carts £17 10s., ditto cart body £4 10s., cistern to hold 400 gallons £4 10s., ditto 600 gallons £7, galvanized ditto 5d. to 9d. per gallon, cattle troughs 30s. to 55s., corn bins 45s. and 65s., strong hog trough 4s. per foot, pump trough 17s. 6d.

**BURROW, J., Broadcliff, Devon.**

One-horse reaping machines £16 to £21.

**BURY AND POLLARD, Southwark.**

Three-horse self-regulating wind engine £110, half-horse ditto £35, crushing mill £7 10s., agricultural pump £16, twisting apparatus £13 10s., conical boiler £9.

**CALVERT, F. C., Manchester.**

Antiseptic fluid 2s. per gallon, smearing salve 1s. per lb., specific for foot-rot 1s. 3d. per lb., carbolic acid 1s. 6d. per lb.

**CAMBRIDGE AND Co., Bristol.**

Horsesakes £7 10s. and £8, press wheel roller and clod crusher £8 10s. to £14, chain and tine-and-chain harrows 57s. 6d. to 100s., two-wheel land presser 6gs., three-wheel ditto 8gs., two-horse gearwork and thrashing machine £21, winnower £9, washing machine 3gs., mangle £4 10s., wringer 25s.

**CARR, T., Richmond-road, Montpelier, near Bristol.**

Disintegrator for granulating conglomerated friable and fibrous materials £70.

**CARSON AND TOONE, Warmminster.**

Horse-hoes 60s. to 85s., single-row grabber 70s., chaff-cutters 70s. to £9, horsegear 12gs., turnip cutters 90s., oil-cake crushers 3gs., cheese presses 55s. to £6.—Awarded first prize of four pounds ten shillings for single-row horse-hoe for ridge and flat, and first prize of six pounds for single-row grabber.

**CARTER AND Co., Swan-lane, E. C.**

Combined reaper and mower £30, screw-power reaper £30, agricultural carts for one horse 11gs., for two horses £16, harvest raves 40s. extra; market cart £16 10s., grabber 70s., chaffcutters 45s. to £7 7s. 6d., manure pump 55s., water carrier 55s., garden engines, lawn mowers, garden seats, &c., including metallic corn-bin japanned inside and out, to keep the corn free from vermin, and to hold four bushels for 25s.

**CARTER AND Co., 237, High Holborn, London.**

Collections of seeds, dried specimens, and growing in pots.

**CHAMBERLAIN, W., Dodbrooke, Devon.**

Horsehoes £6 10s. and 32s. 6d., grabber 2gs., cultivator 6gs. and £7 10s., common apade-plough 3gs. and 4gs., one-way ploughs 70s. and 77s., heavy drag 3gs., light drag 57s. 6d., ridging plough 55s., pair of light harrows 80s.

**CHAPMAN, W., Apethorpe, Northamptonshire.**

Light two-horse waggon £27, three-horse ditto £35, one-horse cart £14, two-horse cart for general purposes £15.

**CHILDS, A. B., 481, Oxford-street, London.**

Mowing machine £22 10s., double-furrow plough £20, circular-saw bench £10, carriage lifting jack 15s., combined cider mill and press £6, California lifting and force pump £5, broadcast seed sower 30s., washing machine 60s., clothes wringer 30s., revolving ditto 30s.

**CLAY, C., Wakefield.**

Cultivator and eradicator £6 15s. to 11gs., chain harrow 80s., horsehoes 47s. 6d. and 57s. 6d.

**CLAYTON, SHUTTLEWORTH, AND Co., Lincoln.**

Steam-engines—ten-horse portable £295, eight-horse £230, six-horse £200; ten-horse horizontal £240, thrashing-machine £27 to £120, grinding-mill £60, circular-saw bench £21, pair of pumps £50.

**CLAYTON AND Co., Paddington.**

Brick-makers £70 to £105; tile, pipe, and brick machine £28.

**CLINTON AND OWENS, Whitefriars, London.**

Variety of pumps 21s. to £23 10s., pump handle 50s., well-engine frames £9 and £18, pillar horse-gear £41 10s., hydraulic rams 5gs. to £30, Holman's fire engine £15, garden engine 35s. to £5 15s., water barrows 42s. 6d. to 52s. 6d., compact fire engine £65.

**COLEMAN AND MORTON, Chelmsford.**

Steam-cultivating apparatus £750, rope porter 60s., cultivators £6 10s. to £13 10s., water cart £20, potato digger £15, clod crusher £17, two-horse gear £13, samples of shares.

**COLTHURST, SYMONS, AND Co., Bridgewater.**

Facsimile of covering to Royal Flemish Farm with patent Roman tiles 11s. per square, ditto ridging tiles 4d. per running foot, ditto sheeting with eaves 4d. per foot run.

**COOMBE, FERRIS, AND Co., 68, Mark-lane, London.**

Millstones £11 and £13, cement stone £24, snut machine £15, flour dresser £33, flour mill and dresser £3, mill requisites, sack barrows 18s., steam and water gauges 27s. to £9, chronometers 50s. to 70s., set of three corn measures 46s. 6d., weighing machines 50s. and 70s., screw jack 40s., pair of pulley blocks 60s., Rushton blocks 37s. 6d., chaff cutters 42s. 6d. and 80s., corn and bean crushers 65s. and £5, and galvanized wire.

CORCORAN AND Co., 86, Mark-lane, London.  
Silk flour dresser £95, wire ditto £36, smut cleaner £25, weighing machine 70s., chondrometer 52s. 6d., set of corn measures (bushel to a quartern) 33s. to 89s., corn meter's bushel 36s., and shovel 24s., maltkiln floor of woven wire 1s. per square foot, model of malt kiln, corn-sample receiver 30s., sack truck 21s., samples of woven wire &c., a variety of mill-stones £8 to £22, seed screen 10 gs., and sundries.

#### CORNELL, J., Cheltenham.

Liquid manure or water carts £14 to £20 15s., wrought iron cistern 24s. to £5, ditto cattle troughs 21s. 6d. to 67s. 6d., corn bin 48s., water cart and engine 90s., compact portable gas apparatus £20, gas meter £10, foliated iron work £5.

#### CORNES, J., Nantwich.

Three chaff cutters, £5, £7 10s., and £8 10s.

#### COTTAM AND Co., 2, Winaley-street, London.

Variety of stable fittings and requisites, pig and dog troughs 2s. 6d. to 10s., ventilators 1s. 6d. to 4s. 3d., corn bins 30s. to 3g., glass lanterns 3s. 9d. to 15s., cast-iron pump 45s.

#### COULTAS, J., Grantham.

General purpose drills £24 and £35, forecarriage steorage 70s. and 90s., corn drills £18 to £28, turnip and manure drills £25 and £28, ryegrass drill £26, manure distributor £14, horseshoe £9.—Awarded third prize of five pounds for corn drill, and third prize of seven pounds for two general purpose drills; also first prize of seven pounds for corn drill adapted to hill-side delivery, and second prize of seven pounds for turnip drill on the flat, as well as third prize of five pounds for drill on the ridge; highly commended for drill for small seeds, commended for general purpose drill and for corn drill for small occupations, also for dry-manure distributor.

#### CRAGGS, R., 34, Wakefield-street, London.

Knife-sharpeners 1s. to 7s. 6d., wringers 12s. 6d. to 50s.

#### CRANSTON, W. M., 77, Upper Thames-street, London.

Haymaker for pony 12 gs.

#### CUTBERT AND Co., Bédale.

One or two horse reaper £22, two horse reaper £24.—Highly commended for one-horse manual reaping machine.

#### DAVEY, J., Crasthole, Cornwall.

Parallel expanding horseshoes with self-acting harrows £3 10s. and £4 2s. 6d., improved horseshoe with three tines £2, lever grubber £4, horseshoe £6 15s. 6d., turnwrest ploughs £3 12s. 6d. and £5 17s. 6d., general purpose plough £4 2s.; cultivator, grubber, and scarifier £11.—Highly commended for horse-rake and for single-row horseshoe on ridge and flat.

#### DAVY BROTHERS, Sheffield.

Portable steam engines—eight-horse £230, six-horse £200, steam hammer £80.

#### DAY, SON, AND HEWITT, 22, Dorset-street, London.

Stock breeders' medicine chest £2 12s. 6d., cattle medicine and pamphlets.

#### DELL, W. R., 72, Mark-lane, London.

Smut machines £55 and £12, mill stones £25 to £32, corn elevators £10.

#### DICKER, J. AND W., Chagford, Devon.

Reaping machine £22, mower for heavy crops £32, bin-bottomed cart 10 gs., hand flour-dresser 5 gs., cheese press 3 gs.

#### DODGE, G. P., 79, Upper Thames-street, London.

Vulcanized indiarubber driving bands, hose, tubing, and double texture waterproof covers, these latter at £1 11s. 2d. to £3 11s. 2d.; gutta percha driving band, indiarubber bucket, deckle strap, ditching and maling boots, driving aprons, capes, coats, &c.—Commended for set of indiarubber vulcanized driving bands.

#### DOWNE AND Co., Plymouth.

Shed or covering £9 10s.

#### DRAY, TAYLOR, AND Co., London Bridge.

Winnow and blower £9 10s., chaff-cutters £5 10s. to £4 15s., corn mill £15, crushing mill £4, harrows £3 10s. and £4 10s., weighing machines 2 gs. and £3 15s., grindstone £2 12s. 6d., portable forge £2 16s., ditto bench and vice £2 12s. 6d., corn bin 37s. 6d., harness 7 gs., American churns £1 6s. to £1 15s., Californian pump £7, lawn-mowers £4 10s. to £6 12s. 6d., self-adjusting scythes 10s. 6d. and 12s. 6d.,

sack trucks 15s. 6d. and 16s. 6d., 15-gallon farmers' boiler £3 6s., small grindstone £1, and a variety of garden seats and tables.

#### EASTWOOD, J., Blackburn.

Compound-action churns for one gallon 30s. to twenty gallons 90s.

#### EATON AND SONS, Thrapston.

Horseshoes 32s. 6d. and 37s. 6d., combined horseshoe and turnip thinner 0 gs. and £10, sheep-crib and trough 22s. 6d., rack-bar lifting jacks 3 and 5 gs., lever ditto 26s. and 27s. 6d., screw jacks 21s. to 25s., combined barrow and sack lift 35s. to 37s. 6d.—Awarded the prize of five pounds for horse-hoe for thinning turnips.

#### EDDY, J., Kenford, Devon.

Corn-drills £8 10s. and £16, grass-seed drill 3 gs., horseshoes 45s., horse-rakes £8 and £9 10s., grubbers 60s., variety of ploughs 2 gs. to 90s., pulverizer ploughs 75s. to £5, drags 70s., harrows 50s. to 75s., rotary sifter £5, gravel screen 50s., draughts 16s. and 20s.

#### FOWLER AND Co., Leeds.

Complete sets of steam-ploughing and cultivating machinery £875, £759, and £693; ten-horse traction engine £450, traction waggon £75, seven-tined cultivator £70, extra strong five-tined ditto £75, steam harrows with slack gear £25, water cart £25, ten-horse portable engine £275.

#### FOX AND Co., Plymouth.

Door mouldings 5s. to 22s. per 100 feet run, door and shutter 3s. 6d. to 10s. 6d. per 100 feet, base mouldings 11s. to 16s., facings 18s., astragals 18s., architraves 22s. to 26s., skirting 10s. to 14s. 6d.; prepared boards grooved, tongued, and beaded, 9s. to 24s. per 100 feet run; ash cart and coach fellows 3s. 6d. to 11s. 6d. the set.

#### FOX AND WALKER, Bristol.

Steam-engines—eight-horse portable £230, ten-horse horizontal £120.

#### FREEMAN AND HARDON, Strangeways, near Manchester.

Patent feeding cake £9 and £11 per ton; "original" condimental food 25s. per cwt.

#### FREER, J., Rothley, Leicestershire.

Grain and seed planter £54, seed planter £20.

#### FRY, A. AND T., Bristol.

Seed and manure drill £6 12s. 6d., grass drill 65s., two-horse mower £22, one-horse reaper £18, haymaker £14, horse-rakes 30s. to 70s., one-horse carts £13 to £15, two-horse carts £16 10s., Hannam's harvest carts 10 gs., chaise cart £21, winnowing machines £6 10s. to £8 10s., sheep rack 3 gs.—Awarded third prize of two pounds ten shillings for harvest cart, and highly commended for haymaking machine.

#### GARRETT AND SON, Leiston Works, Suffolk.

Sixteen-horse portable steam-engine £420, ten-horse ditto £270, four-horse £170, combined thrasher and dresser £75 and £125, straw-bruise £45.

#### GARTON AND KING, Exeter.

Cooking stoves 21s. to £27, Cubbett or wood-fire grate £5, crinoline guard gate 12 gs., garden lounges 20s. to 32s. 6d., garden chair 12s. 6d., verandah chair 16s. 6d., garden engine £7 10s., set of stable cess-pits and other requisites; wire fencing; field-gate 40s.

#### GERRANS, W., Tregony, Cornwall.

Corn and seed drill £18, land-presser drill 12 gs., portable horse-rake £7, broadcast-sower £7 10s.—Awarded second prize of four pounds for land-presser drill.

#### GIBBONS, P. AND H. P., Wantage.

Seven-horse portable engine £215, combined thrashing machine £112.

#### GIBBS AND Co., Half-moon Street, Piccadilly.

Collections of specimens of permanent grasses, agriculture and other seeds, and also growing specimens in pots.

#### GILBERT, W., Shippon, Berks.

Corn drill £25, steorage £4, turnip and mangold drill £20 corn and seed drill £18 10s., one-row drill 2 gs.

#### GLIDDON, J., Williton, Somerset.

Kitchen Ranges £3 3s. 6d. to £18, American kitchener 0 gs., roasting apparatus £3 10s. and £4, heating stoves £1 12s. and £1 15s., iron bath £4 10s., saddle boiler

£4 10s., hot water coil 3 gs., force pump £4 10s., hydropult £1 14s. 6d.

Goss, J., Plymouth.

Stencil plate letters 9d. per letter, branding figures and irons 4d. to 1s. per letter, various kinds of type 1d. per letter.

GOUCHER, J., Worksop.

Several sets of drum-beaters £3 9s. to £3 19s. 8d., drum and concave £22 16s., three drum ends £1 2s. 6d.

GOULDING, W. and H. M., 108, Patrick-street, Cork.

Special manure £10 per ton, bone manure £7 per ton, superphosphate £6 per ton.

GOWER AND SON, Winchfield, Hants.

Variety of drills £2 16s. to £33, drill presser for two furrows 9 gs., broadcast seed machine £3 10s. and £5 15s., broadcast corn distributor 5 gs.—Awarded first prize of eight pounds for two-coulter ridge manure drill for turnips and mangolds, third prize of five pounds for two-coulter ridge drill for turnips and mangolds; first prize of six pounds for two-furrow drill presser, and commended for fifteen-coulter and thirteen-coulter corn and seed drills; also silver medal for broadcast seed distributor.

GRANT, J., 26, Cockburn-street, Edinburgh.

Copies of the *Scottish Farmer* 3d.

GREEN AND SON, Leeds.

Four-horse steam-engine £85, lawn mowers £3 10s. to £24, garden rollers £2 10s. to £7 10s., garden seats £1 18s. to £2 7s. 6d., morticing machine £12 10s., wire sofa £1 12s. 6d., Green's pump £26 and £15, garden engines £3 19s. to £6 10s., sausage machines 2 gs. to £16.

GREENING AND CO., Manchester.

Assortment of wire fencing 4d. to 4s. 3d. per yard, straining pillars 30s. and £2, standards 18s. to 20s. 6d. per dozen, fencing wire 12s. 6d. to 85s. per cwt., hurdles 1s. 11d. to 12s. per yard, bar fence 1s. 11d. to 3s. 9d. per yard, gates and pillars, tree guards, garden seats, &c.

HARE AND CO., 81, Essex-street, Strand, London.

Specimen illustrations of machinery and prize medals.

HARVEY, T., Plymouth.

Sulphate of ammonia £14 per ton, potato manure 90s., wireworm destroyer 80s., cements 20s. and 40s. per ton, ichthyosaurus fossil £100, ammonite ditto £20, of other animals £20.

HAWKES, T., Tiverton.

Manure and other drills £16 to £25, horsehoes 50s. and 70s., pulverizer ploughs £5 and £5 10s., general-purpose ploughs 70s. to 80s., corn crushers, £6 10s. and £12 10s., chaff cutters 45s. to £7 7s. 6d., Eclipse reaper 16 gs., carriage lifter 15s., butter machine 10s. 6d. and 2 gs., case of cattle oils 2s. each, cattle food 18s. per cwt.

HAYES AND SON, Stamford.

Waggons £29 to £44 10s., lorry £30, single-horse carts £14 and £14 10s., two-horse carts £14 to £15 15s.—Awarded the prize of ten pounds for light strong wagon, first prize of four pounds ten shillings for single-horse cart, first prize of same amount for two-horse cart, and second prize of three pounds for harvest cart.

HAYWARD AND CO., 84, Whitecross-street, London.

Farm fire-engine or irrigator £33, garden-engine ditto £9 10s. 2d., liquid-manure pump ditto £12, pump on plank 100s., three-way cock and a variety of other pumps and garden-syringes.

HEADLEY, Edward, Cambridge.

Drag-rakes 9 gs., cattle-troughs, 23s. to 65s., pig troughs 15s. to 27s., sheep troughs 24s. to 28s., wrought-iron manger 88s.

HEARDER, J. N., Plymouth.

Cooking and other stoves £5 to £14 10s.

HELLARD, R., Taunton.

Victoria self-acting side-delivery reaper £35, reaper with cranked bar £35.

HENTON AND SON, Westminster Bridge Road.

Elastic saddles £5 10s. to £10, saddle stands 12s., croquet or cricketing tent £5 10s.

HENWOOD, N., Tideford, Cornwall.

Manure distributor, with seed-box, £12 10s., self-acting sheaf-delivery reaper £30.

HILL AND SMITH, Brierley Hill, Staffs.

Expanding horsehoe 3 gs., skims 25 to 26, light land-roller 10 gs., rick-stands 25 to £30 10s., sheep racks 80s., sheep troughs 30s. to 30s., gravel screen £6 16s., wheelbarrows 27s. 6d. and 35s., heating barrow 60s., black varnish 1s. 6d. per gallon, wire netting 3d. to 7½d. per yard and 8d. per super. foot, garden seats 45s. to 55s., garden roller 50s. to 90s., tree guards 12s. and 21s., field gates 26s. 6d. to 70s., entrance gate and pillars £8 to £15, wicket gate ditto 37s. 6d., variety of sheep and cattle hurdles and fences; turnstile gate and bow 46s.

HILL, M., Holsworthy, Devon.

Five hunting saddles 4 gs. to £5.

HINDLEY, E. S., Bourton, Dorset.

Screw cider press £18 and £30, apple mill 14 gs., cider screws £8.

HOEG, W., Upton Pyne, Devon.

Two-horse reaper £20, wheat drill £18.

HOLMES AND SONS, Norwich.

Corn and seed drills £27 down to £17 10s., seed and manure drills £22 8s. 6d. and £21 10s. to £24 7s. 6d. and £24 "economical" ditto £15 2s. 6d., ridge roller drill £3, hand drills £2 and £2 15s., small 26-lever £22 18s. 6d., manure distributor £15 2s., broadcast sower £9 10s., horsehoe 10 gs., rotary harrow £10, six-horse portable engine £200, combined thrashing machine £120, circular-saw table £26 10s., corn dresser 9 gs., barley hummeller £4 10s.—Awarded the second prize of three pounds for corn drill for hill-side delivery; silver medal for their new rotary harrows, and highly commended for corn drill for small occupations.

HORNSBY AND SONS, Grantham.

Various drills £17 10s. to £38 15s., drill presser 10 gs., manure distributor £13, horsehoes £3 to £13, grass mower £22, self-raking reaper £35, swathe-delivery ditto £34, chaff-delivery ditto £23, one-horse ditto ditto 19 gs., drop-shed ditto 16 gs., eight-horse portable steam engine £235, combined thrashing machine £110, variety of ploughs £2 12s. 6d. to £5 1s. 6d., turnip cutters £4 10s. and £4 2s. 6d., root pulpers £4 12s. 6d. and £4 2s. 6d.; washing, wringing, and mangling machines £3 to 8 gs., india-rubber wringer one guinea.—Awarded first prize of ten pounds for general purpose drills, third prize of four pounds for corn and seed drill for small occupations, third prize of five pounds for turnip drill on the flat, first prize of six pounds for "small seeds" drill; second prize of eight pounds for improved mower of natural and artificial grasses, first prize of eight pounds for combined reaper and grass mower, third prize of five pounds for one-horse reaper with grated drop-sheaf apparatus, first prize of ten pounds for two-horse reaper with chain delivery, second prize of five pounds for two-horse reaper with grated drop-sheaf apparatus, and first prize of twenty-five pounds for self-acting swathe-delivery reaping machine; also highly commended for corn and seed drill, and for dry manure distributor.

HOWARD, J. AND F., Bedford.

Double-action haymakers 11 to 18 gs., horseshoes £7 15s. to £10, steam-cultivating machinery, with the necessary anchors, snatchblocks, &c., including two 14-horse self-propelling steam engines, £1,250; traction waggon £50; travelling house £65; steam-cultivating apparatus, with 10-horse portable engine, £550; double-action steam cultivator £31, water cart £20, ridging body and subsoil tine for steam cultivation £3 15s., four-furrow steam plough £80, three-furrow ditto £65, set of steam harrows £22 10s., variety of ploughs £2 7s. 6d. to 10 gs., harrows £2 10s. to 6 gs., plough sledge £1 10s., scarifier £9, whippetrees 17s. 6d. to £2 10s., dynamometer 3 gs.—Awarded first prize of six pounds and second prize of five pounds for haymaking machines, and first prize of six pounds for horse rake.

HUMPHRIES, E., Pershore, Worcestershire.

Combined thrashing machine £93; six-horse portable steam engine £203.

HUNT AND PICKERING, Leicester.

Seed drills 18 gs. to £24, turnip drills £3 15s. to £6 10s., back steerage £4 10s., horsehoes 3 gs. to £8 10s., combined plough and scarifier £5, harrows £3 10s. and 4 gs., cultivator and grabber £7 10s., ploughs £4 to £3 10s., sack barrows 12s. 6d. and 21s., angle twitch rakes 3s. 6d., oilcake breakers £3

5s. to 25, corn crushers and kibbling mills 24 10s. to 8 ga. malt mill 25 10s., turnip slicer 23 15s., root pulpers 23 15s. to 24 10s., cheese presses 23 10s. and 23 15s., garden seats 18s. to 21 5s. 6d., garden table 25s., adjustable scythes 10s., milk can and carriage 23 15s., pair of garden vases 29.

HUNT, R. AND R., Halstead.

Clover and trefoil-seed drawer 250, one-horse gear 211 10s., corn and seed dresser 23 8s., turnip cutter 20s., disc root pulpers 75s. and 4 ga., root grater 4 ga., oilcake breakers 8 ga. and 95s.

HUTCHINGS, W. A., Exmouth, Devon.

Waggonette 284; dog cart 268 5s.

HUXHAM AND BROWN, Exeter.

Smut machine 216, set of one ton differential pulley blocks 50s., with chain 9d. per foot, lifting jack for four tons 26, to lift eight tons 8 ga., Biddell's combined mill 26, millstones 211 to 215 10s., Indian-corn mill 100s.

HUXTABLE, W., Ottery St. Mary, Devon.

Haymaker 210, horsrake 23, two-horse reaper 218, pair-horse waggon 222.

IRELAND, J., Edward-street, Manchester.

Three-motion churns for four gallons 40s., to twenty gallons 90s.

JAMES, ISAAC, Cheltenham.

Liquid manure distributors, 213 to 226, street water cart 222, liquid manure pumps 55s., india rubber suction pipe 3s. per foot, gapping drills 10s. 6d., mortar temperer 7 ga.; washer, wringer, and mangler 25 to 29; cloth dryers 38s.

JOHNSTON, P., 290, Oxford-street, London.

Butter churns, to make 21bs. 18s., ditto 25lbs. 6s., mangle 10ga., butter prints 6d. to 5s., case of butter knives and beaters 1s. to 5s.

JONES, J. M., Gloucester.

Leather composition 1s. per box; foot rot specific 2s.

KEARSLEY, H., Ripon.

Grass mower 222 10s., reaper with back delivery 222, one horse reaper 16 ga., combined reaper and mower 226 10s., hay-maker 15 ga.—Received third prize of seven pounds for grass mower, and highly commended for combined reaper and mower.

KITMER, B., Fulston, Linc.

Combined blower and dresser 29 (two specimens).

LAPOUREUX, CLARE, AND CO., Plymouth.

Miscellaneous collection of seeds for farm and garden culture.

LARKWORTHY AND CO., Worcester.

Combined horseshoe and grubber 85s., variety of ploughs 65s. to 95s., "excalibur" harrows 45s. to 26, scuffle drags 35s. to 25, whippetrees 15s.

LEBLANC, D. F., 102, Fleet-street, London.

Dioptical water-gauge tube for steam boilers 3s. to 40s.

LEWIS, G., Kettering.

Steorage corn and seed drill 216 10s., steorage lever horseshoe 7 ga.—Highly commended for small occupation corn drill.

LUKE, W. H., Plymouth.

Printing machine by Harrild, paper-cutter by Dawson, and table.

LUXTON AND CO., Hatherleigh, Devon.

Two-horse light reaper 218, corn drill 218, turnip or manure drill 28, winnower 27 10s., hay-turner 27 10s., horsrake 29, combined thrashing and winnowing machine 250, double moulding and drilling plough 50s., chaff cutters 6 and 8 ga., corn and seed crushers 6 and 8 ga.

LYON, A., Windmill-street, Finsbury.

Mining machines 10s. 6d. to 26 10s., chopping boards 4s. and 6s. 6d., tobacco cutters 1s. 9d. to 2s. 6d., cucumber slicers 1s., bread-cutters 16s., apple-parer 8s. 6d., whipping can 3s., kitchen knives 1s. 8d., sausage-meat forciers 20s. to 40s., root pulper 27 10s., easement 8s. 6d., vegetable cutters 4s. 6d.

MACNAUGHT AND SMITH, Worcester.

Landan 2220, Whitworth dogcart 255, and Malvern dogcart 248.

McNILL AND CO., Bunhill-row, London.

Asphalted roofing felt 1d. per square foot, bituminous felt

1d. per foot, hair felt 7d. to 1s. 8d. the sheet, rubber compound for steam joints 8d. to 1s. the set, and models.

MANCUE, E., 174, Fleet-street, London.

Butter cleaner 10s. 6d. to 20s., scales 5s. to 60s., nose ring 4s., wringer 10s. 6d. to 24s., stable door detector 2s.

MAPPLEBECK AND LOWE, Birmingham.

Chaff cutters 45s. to 10 ga., oilcake breaker 3 ga., turnip cutters 4 and 5 ga., cheese press 50s., manglers 70s. and 10 ga., weighing machines 2 to 5 ga., chain harrows 35s. to 70s., tormentor 45s. to 50s., grindstone with treadle 45s., road scraper 70s., drills 52s. 6d. to 90s., corn bins 32s. to 44s., emigrant's or farmer's tool chest 25 10s., portable forge 4 ga., smith's bellows 3 ga., anvil 28s. per cwt., staple vice 11s. and 20s., arms and boxes 28s. per cwt., mail axles 25s. and 27s. 6d., horseshoes 2 ga., pulley blocks 7s. and 34s., hurdles 210 15s. per ton, lifting jacks 25s. to 10 ga., lifting crab 55s. and 28 7s. 6d., granary crane 27 10s., galvanized buckets 2s. 6d. to 3s. 6d., hop press 2 ga., sack cart 9s. 6d. to 16s. 6d., drag rakes 8s. 6d. and 12s. 6d., wire strainer 2 ga., bundle of wire 14s. per cwt. of 300 yards, set of hames 26s. 6d. to 36s. 6d., spades 3s. 3d. to 4s. 6d., shovels and cast steel digging and manure forks 8s. to 4s. 6d., hay forks 1s. 9d. to 3s. 6d., set of draining tools 39s., patent spades 3s. 3d. to 5s. 6d., weather vane 55s., metallic churns 26s. to 37s. 6d., garden engine 25, stack ventilator 3 ga., dynamometer 50s., garden seats 17s. 6d. to 30s., vermin traps 6s. to 30s., garden syringes 4s. 6d. to 14s.

MARSHALL, W., Upton Pyne, Devon.

Two-horse waggon 226, light ditto 224, plank side cart 214, light one-horse cart 212 10s.

MARSHALL AND SONS, Gainsborough.

Portable steam engines—nine-horse 2251 5s., five-horse 2181 5s., combined thrashing machines 292 and 2140.

MAUNDER, J., Ottery St. Mary, Devon.

Reaping machines with side or back delivery 221.

MAYNARD, R., Whittleford, Cambs.

Chaff engine 242, additional wheel with four knives 23 5s., instrument for changing ditto 3s., riddle ditto 14s., six-horse portable engine 2308.

MELLARD, F., Uttoxeter, Staffs.

Cheese-maker 213 15s., cheese press 23.—Awarded silver medal for "Pugh's" patent cheese-making machine.

MELLARD, J., Rugeley, Staffs.

Turnip and mangold seed drill 6 ga., ridging plough 23 10s., grubber and horseshoe 23, horseshoe with revolving harrow 30s., chain harrow 23, disc pulpers 23 10s. to 5 ga., corn-crusher 24, chaff cutters 2 ga. to 10 ga., oilcake breakers 23 15s. and 25, carriage jack 12s., curd mill 21 14s., cheese presses 22 17s. to 25.

MERRYWEATHER AND SONS, Long Acre, London.

Light steam fire engine 2400, Paxton fire engine 2112, hand fire engine 230, reel, fire-pump, and fire bucket.

MILFORD, G., Thorverton, Devon.

Pair-horse waggons 222 and 227, one-horse cart 211, two-horse cart 213 10s., harvest cart 214, market cart 214.—Commended for pair-horse waggon and two-horse cart.

MILFORD, F. P., Kenn, Devon.

Two-horse tipping waggon 228 10s., ditto for general purposes 223 10s., Leeds one-horse carts 214 10s., Plymouth harvest cart 12 ga., general cart 211 10s., two-horse farm and road cart 216, harvest cart 10 ga., lifting jacks 15s. and 17s. 6d.—Highly commended for two-horse cart.

MILFORD AND SON, Thorverton, Devon.

Pair-horse waggon 224, three or four-horse waggon 229, two-horse tipping waggon 237, one or two-horse waggon 221, corn lades 21 extra, one-horse cart 214, two-horse cart 213 10s., harvest cart 212 10s., market cart 19 ga., lifting jack 25s.—Awarded second prize of six pounds for pair-horse waggon, commended for "other waggons"; second prize of three pounds for two-horse cart, and commended for single-horse cart.

MOORE AND CO., Upper Marylebone-street, London.

Tool sharpeners 1s. to 2s. 6d., water gauge glasses 4s. 8d. to 6s. 6d. per dozen lengths, sheep marks 1s. to 5s. each.

MORTON AND CO., Liverpool.

Self-acting winding straining pillar 45s. and 32s. 6d., wire fence and telegraph 2155 to 2166 per mile, wire fencing 44d.

to 6s. per yard, the post 27s. 6d., gates 13s. to 75s., lightning conductor 1s. 6d. to 1s. 10d. per foot, barn roof £70, iron cottage £135, country house £400 to £500; ornamental church; farmyard roof £378 to £390 to cover 100 by 100 feet.

MUDFORD, G., South Relford, Notts.

Stack &c. covers 1s. 6d. to 2s. per yard, tents and marquees 2s. per yard, machine belting 1s. 6d. per lb., cocoa matting 1s. 6d. to 2s. per yard.

MUSGRAVE, BROTHERS, 59, High-street, Belfast.

Full-sized horse stalls 87s. 6d. to £8 15s., variety of stable fittings and of double-stall cowhouse, iron piggery £13 10s., piggery yard £7 15s., piggery front 95s., slow combustion stoves 70s. to 10 gs., conservatory stove with vapour chamber.

NEIGHBOUR AND SONS, 127, High Holborn, London.

Beehives 5s. to £10 14s. bees included, bees dress protector 5s., artificial combs 6s. per dozen, honey cutters 5s. per pair, pressing roller 7s. 6d., bottle feeder 2s. 6d., fumigator 2s. 6d., fungus 1s. per packet, indiarubber gloves 5s. 6d. per pair, bee feeding trough 5s.

NEWTON, WILSON, AND CO., 144, High Holborn, London.

Variety of sewing machines 2 to 16 gs.

NICHOLSON, W. N., Newark.

Haymakers 10 to 15 gs., horsesakes £7 10s. to £11, oilcake breakers 60s. to 10 gs., land rollers 12 gs., sack elevators 52s. 6d. to 73s. 6d., ditto and weighing machine £5 15s. 6d., winnower £10, elevating apparatus for sacking corn from winnower 73s. 6d., portable steam engine £115, garden rollers 65s. to £7, wine and bottle racks 18s. and 30s., block-tin malt and grain shovels.—Highly commended for haymaking machine.

NORRINGTON AND CO., Cattle Down, Plymouth.

Samples of manure £6 5s. to £10 per ton, saddle-girth 13s. 6d., Peruvian guano £13 5s. per ton, linseed cake £12 10s. per ton.

NUNN, J. P. AND E. B., Royston.

Drill for small seeds £16 10s., self-cleaning horsehoe £12 and single-row grubber 60s.

NYE AND CO., 873, Oxford-street, London.

Mincing and sausage machines 12s. 6d. to 12 gs., small mills 6s. to 20s., rotary knife cleaners 40s. to £10 5s., taps 1s. 6d. to 2s., vegetable cutters and slicers 20s.

OLDHAM AND BOOTH, Hull.

Bone mills £47 to £200, bone and dust mill £90, eight-horse single-cylinder portable steam-engine £230, steam winch £267 10s.

PAGE, R., Mordach Bishop, Devon.

Two-horse reaper £20, one-horse ditto 16 gs., corn drill £20, winnower £9, reed-maker £6 10s.

PAGE AND CO., Bedford.

Turnip and mangold horsehoes 2 gs. and £2 10s., Leeds prize horsehoe £2 15s., combined horsehoe, five-tine grubber, and moulding plough, £4 15s.; hay, corn, and stubble rakes £7 10s. to £10; field roller £7 15s., pipe and tile machines 18 gs. to £20, one-horse gear work £12, chaffcutters £2 10s. to 11 gs., disc root pulper £4 10s., linseed cake mills £3 5s. and £3 15s., various ploughs £2 7s. 6d. to £4 5s., four-wheel scufflers 5 and 6 gs., sets of harrows £2 7s. 6d. to £4, whippetrees 7s. 6d. to £1 6s., bench drilling machine £7.—Awarded second prize of three pounds for single-row horsehoe on ridge and flat, and second prize of four pounds for horse rake

PARHAM, W. Bath.

Fences 7d. to 3s. 3d. per yard, hurdle fencing 7s. per yard, gate and pillars £2 10s., tent 10 gs., gates £1 2s. 6d. to £25.

PARKES AND CO., Birmingham.

Draining tools £1 10s. to £1 18s. per set, digging forks 3s. 6d. to 5s., other solid cast-steel forks 1s. 9d. to 15s., spades and shovels 1s. 3d. to 4s. 6d.; axes, hatchets, choppers, hooks, trowels, hammers, and hoes, from 1s.

PARKIN, F., Exeter.

Cider press £22, screw and nut with two levers £8 10s., apple-breakers 16s., garden chairs 16s. to 2 gs., Cobbett stone £5.

PARSONS, G., Martock, Somersetshire.

Eight-horse portable engine £225, 2½-horse ditto £63, flax-reaper and scutcher £63, flax-seeder 7 gs., one-horse cart

11 gs., travelling wheels £7 15s. down to £6 per pair.—Awarded silver medal for combined flax-breaking and scutching machine.

PRICE, A. E., 75, Bridge Road, Hammersmith.

Cattle troughs £1 2s. to £3 5s., sheep troughs 17s. 6d. to £1 10s., pig troughs 9s. 6d. to £1 6s., sheep cage 12s., portable fence £3 5s., water cart or fire engine 16 gs., rotary pump or ditto £3 7s. and delivery hose 1s. 2d. per foot, tubular wheelbarrow 30s., "eclipse" portable piggery £7, "excelsior" shepherd's house £18, corn screens £5 10s. and £9 5s., spare screen cylinders £2 and £3 10s., noiseless winnowers £8 and £9, sack holder 25s.—Awarded silver medal for improved cattle troughs.

PENNEY AND CO., Lincoln.

Corn separators 12 gs. to £21, malt screen £4 10s., grave or lime screen 30s., sack lifter £2 12s. 6d., meat safes £1 to £2, game or poultry netting 4d. to 6d. per yard, garden sofa £2, ditto chairs 15s. and £1, ditto stools 4s. 6d. and 7s. 6d., ditto baskets 4s. and 7s. 6d., corn screens 11 and 13 gs., set of six japanned wire dish covers £1 4s.

PETHICK, J., Tamerton Foliot, Devon.

Hand winnower £10, two-horse farm cart 10 gs.

PHILLIPS, E. A., 8, Southampton Buildings, Chancery Lane, London.

Rotary spade or digger £50.

PHOSPHO-GUANO COMPANY, London and Edinburgh.  
Phospho-guano in its raw and prepared condition, and specimens of grain and other produce raised by its aid alone.

PICKSLEY, SIMS, AND CO., Leigh.

Chaff cutters 45s. to £24, oat and bean crushers 65s. to £15, steel mills 90s. to £15; horse bruiser £18 10s.; turnip cutter, slicers, and pulpers 85s. to £7 10s., oilcake breaker 65s., lawn mowers £5 to £6 10s., wringing and mangling machines 55s. to 75s., two-horse mower £22, ditto reaper £22 10s., one-horse reaper £21, horse-rakes 32s. 6d. to 45s., two-horse gear £9 10s., rasping mill £60, grinding apparatus 50s. to 95s. 6d., six-horse horizontal steam engine £160, four-horse vertical ditto £115, drag-rake 11s. 6d. and 18s., twitch and stubble rake 4s., whippetrees 10s. 6d., sundry garden chairs, sack trucks, pig troughs, hay and manure forks, with two-horse vertical steam engine £55.—Awarded third prize of five pounds for two-horse reaper.

PITTS, THOMAS, Plymouth.

Odum's superphosphate of lime 5 gs. per ton, prepared guano £9 10s., blood manure £7, dissolved bones £7, concentrated phosphate £8 15s., special potato manure £7 10s.

PLENTY, E. P., Newbury.

Water or liquid manure carts 11 gs. to £18 10s., galvanized iron pump £4, ditto sheep troughs 20s. to 45s., cattle trough 30s., lamb trough 18s.

PLIMSAUL BROTHERS, Plymouth.

Various ploughs 2 to 7 gs., wheel hand rakes 40s., horse rakes 38s., and £3, drag rake, 18s., haymaker £8, lawn mowers 90s. and £7 10s., combined mower and reaper £26, one-horse "eclipse" reaper £17 6s., winnower £7, harrows 40s. to 80s., scuffle drag 4 gs., whippetrees 15s., corn mills 3gs. and 87s. 6d., combined mill 9 gs., corn crushers 5 gs. to £6 10s., linseed cake breaker 70s., turnip cutters 85s. and 5 gs., chaff cutters 45s. to £10 10s., seed drill £20, sack barrows 12s. and 14s., set of corn measures 37s., seed distributor 50s., scythes 10s. and 18s., and variety of miscellaneous articles.

PONTER, M. L., Plymouth.

Specimens of seeds, roots, and trees.

PORTER AND CO., Lincoln.

Coal gas apparatus £45, corrugated steel for ditto £20.

POWIS, JAMES, AND CO., Lambeth.

Combined mortising machines £16 to £36, circular-saw benches £21 to £60, endless-band sawing machine £38, general joiner £75, tenon-cutter £75, floor-board planer £175.

POWIS AND CO., Milwall Pier, London.

Mortising machines £16 and £21, band-sawer £38, joiner £90, saw benches £40 and £70, brickmaker £200.

PREECE, T., Leominster.

Corn drills 5 to 21 gs., mangold drills £3 10s. to £5 15s., horsehoe £2 10s., grubber 3 gs., corn drill £28.

**PRIEST AND WOOLNOUGH, Kingston, Surrey.**

Lever drills £16 8s. to £37, turnip and manure drills £19 to £30, grass seed drill £24, manure distributor £16 10s., horse-hoes £14 to £19.—Awarded the first prize of ten pounds for general purpose drill, second prize of seven pounds for lever corn drill, second prize of five pounds for corn drill for small occupations, first prize of eight pounds for drill for turnips &c. on the flat, second prize of seven pounds for drill for turnips &c. on the ridge, and second prize of four pounds for drill for small seeds; also highly commended for general purpose drill, and received the second prize of five pounds for horsehoe for general purposes, and the second prize of seven pounds for dry manure distributor.

**PUCKERING AND CO., Beverley.**

Leeds price market cart £21, other carts £18 10s., £25, and £32, dog-cart £45, waggonettes £45 and £120, saddle stands 12s. 6d., single-horse harness 13 gs., pendons 1s. each.

**RANSOME AND CO., 31, Essex-street, Strand, London.**

Long's non-poisonous specific for cure of scab in sheep 4s. 6d. per gallon, ditto for killing ticks in sheep 2s. 8d. per gallon, concentrated non-poisonous eradicator 4s. per gallon, non-poisonous sheep-dipping composition 1d. to 1½d. per head, dressing fork and sheep skins with fleeces.

**RANSOMES AND SIMS, Ipswich.**

Variety of ploughs £2 7s. 6d. to £7 5s., potato-raising body £1 17s. 6d., ridging body £1 17s. 6d., digging body 7s. 6d., whippetrees £1 5s. and £2 10s., pomeltrees 12s. 6d., sets of harrows £4 5s. and £4 10s., corn screen £15, root pulpers £4 14s. 6d. and £7, bean cutter £4, steel mills £3 15s. to 9 gs., universal mill £13 10s., two-horse iron gear £4 5s., lawn mowers £6 10s. to £8, eight-horse power portable steam engine £230, combined thrashing machine £136, ninety-gallon feeding pan £3.—Awarded silver medal for semi-circular pomeltrees.

**RAYNBIRD AND CO., Basingstoke.**

Collection of samples of seeds and new cereals, oilcakes, and manures.

**READING IRON WORKS COMPANY.**

Haymaker £15, horse rakes 7 gs. and £8 10s., eight-horse fixed steam engine £95, eight-horse portable £230, six-horse portable £195, three-horse ditto £120, thrashing machines £75 and £110, perforated beater drum £8 10s., portable thrashing machine and horse-gear £41, portable grinding mill for horse-power £66, circular-saw bench £25 10s., chaff-cutters £2 5s. to 12 gs., oilcake mill 3 gs., barley-horner £4 15s., two-horse gear £12 5s., grass and seed broadcast sowing machine 3 gs., combined sack cart and holder £1 11s. 6d.

**REEVES, R. AND J., Westbury, Wilts.**

Manure, corn, and seed drills £25 5s. to £37 5s., corn drill £31 10s., ditto and bean planter £32 10s., corn and seed drill for small occupations £18, other drills £12 to £31 10s., manure distributors 10 gs. to £17, water cart £15, barrow pump £6 11s. 4d., winnower 10 gs., corn screens £5 10s., thistle destroyer 10s.—Awarded the prize of ten pounds and first prize of eight pounds for liquid manure corn and seed drill on the ridge, and second prize of seven pounds for four-row liquid manure and seed drill on the ridge; highly commended for four-row manure and seed drill on the flat, also on the ridge, and commended for general purpose drill.

**RICHES AND WATTS, Norwich.**

Eight-horse portable engine £230, grist mills £15 to £27, corn mills £7 10s. to £12, chaff-cutter £8 10s.

**RICHMOND AND CHANDLER, Salford.**

Chaff-cutters £2 10s. to 18 gs., corn crushers 5 gs. to £11 10s., two-horse driving gear £16 10s., four-horse ditto £24, root washer 4 gs., turnip cutter £3, steaming apparatus £6 9s., sack holders £1 3s. and £1 12s., bread kneaders £5 and £25, oat and bean crusher £16 6s., four-horse steam engine £165.

**RIDLEY AND CO., Grantham.**

Eight-horse portable engine £220; ditto combined thrashing machine £110.

**ROBERTS AND SONS, Bridgewater.**

Market carts 10 gs. to £14, Malvern dog carts £21 to £36, Whitechapel ditto £20 to £26, waggonette £55, and a set of dog-cart harness £7 10s.

**ROBEY AND CO., Lincoln.**

Eight-horse portable steam engine £230, combined thrashing machine £115, self-acting circular-saw bench £65, portable mill £25.

**RUSTON, PROCTOR, AND CO., Lincoln.**

Portable steam engines—eight-horse £230, six-horse £200 four-horse £165, thrashing machines £105 and £118 10s. portable mills £75 and £119, circular-saw bench £14 10s. to £45, centrifugal pump £52 10s.

**ST. PANCRA'S IRON WORKS COMPANY, Old St. Pancras-road, London, N.W.**

Unerring gate latch 4s. 6d. to 5s. 6d., iron field gate and posts £3 9s. 9d.; models of stalls, loose boxes, and variety of stable fittings; full-sized model of cow stall £2 7s. 6d. per cow iron piggery £13 11s. 6d., sheep and cattle hurdles 4s. 2d. to 7s. 11d., pair of hurdle field gates £1 5s., wired hurdles, running fences, and tree guards.

**SAINTY, J., Burnham, near Lynn.**

Corn and seed drills £16 10s. and £28 10s., lever horsehoe £16, manure distributor £16 10s.

**SAMUELSON AND CO., Banbury.**

Self-raking reaper £30 and £35, meadow mowers £20 and £21 10s., combined reaper and mower £23 and £26, "Eclipse" reapers 16 gs., haymaker £14, turnip cutters 5 gs. and £4 5s., root pulpers £4 5s. and £4 10s., chaff cutters £2 8s. to £10, lawn mowers £4 10s. to £7 10s., and linseed-cake breakers £3 and £3 10s.—Awarded second prize of seven pounds for one-horse reaper, and second prize of fifteen pounds for side-delivery reaping machine.

**SAWNEY, W., Beverley.**

Horsehoe £5 10s., winnower £6 5s., combined winnower and blower 10 gs. and £11, treadle grindstones 44s. and 52s., treadle boot cleaner 2 gs., bread-cutter, riddles 40s. and 50s., sack lifter and tilter £3 10s. and £3 18s., cinder sifters 50s.

**SCRAGG, T., Calveley, Cheshire.**

Pipe, tile, and brick maker, £21.

**SHARMAN, W., Melton Mowbray.**

Hay or corn rakes 1s. 6d. to 16s. 6d., drag rakes 10s. to 16s. 6d., stubble rakes 4s. and 5s., scythe sheaths 5s. 6d. to 9s. 6d., flour bin 18s. to 25s., sack trucks 14s. and 16s., strained wire fencing 14s. per cwt., bundles of wire stretches 13s. 6d. each.

**SHAW, JOHN, New Wortley, Yorkshire.**

Flexible lawn mowers 70s. to £11 10s., and Gardner's tur nip cutters 4 to 5 gs.

**SIMPSON'S CATTLE SPICE COMPANY, Hull.**

Cattle spice 5s. per canister and 70s. per barrel; digestive powders 1s. per packet.

**SKELTON, J., Bodmin Hill, Cornwall.**

Two turnwrest ploughs £5 10s. and £6 with skim coulter.

**SMITH, WILLIAM, Kettering.**

Steering horsehoes £8 to £9 10s., useful horsehoe £6 10s., single-bar horsehoe 80s., winnower and blowing machines 9 gs.—Awarded third prize of four pounds for general purpose steering horse-hoe, and third prize of two pounds ten shillings for single-row horse-hoe for ridge and flat.

**SMITH, BROTHERS, Thrapston.**

Haymaker 15 gs., horse-rake £7 15s., grist mills £5 to 15 guineas, bean mill 50s., and oilcake mill 65s.

**SMITH AND CO., Liverpool.**

Palm-nut meal £6 per ton.

**SPONG, J. O., 45, Mortimer Road, London.**

Sausage and mincing machines 10s. 6d. to 4 gs., wring 12s. 6d. to 30s., domestic articles from 1s.

**STEPHENSON BROTHERS, Plymouth.**

Chaff-cutters 45s. to £10, corn crushers 5 gs. to £6 10s., turnip cutters 85s. 6d. to £5 8s. 6d., root pulper 73s. 6d., lawn mower £6, garden engines 55s. to £5 10s., syringe 8s. 6d., garden roller 2 gs., set of corn measures 31s., lift pump 30s., manure pump 55s., washing machines 70s. to £6 14s. 6d., lever weighing machines 58s. to 84s., asphalted roofing felt 1d. per foot, flower stand 75s., kitchen range £11, ice prodnear 25 gs. to 63s., refrigerators 50s. and 75s., ice safe £7, freezing compounds in cases 11s. and 22s., cooking apparatus 39s. to £22, Cobbett's stove 5 gs., laundry boiler 55s., pig troughs 3s.



to 20s., galvanised netting 5d. to 1s. 3d. per lineal yard, sheep shears 3s. and 4s., filling axes 2s. to 5s. 6d.

**SUMMERSALES AND SON, Keighley, Yorkshire.**

Variety of washing, wringing, and mangling machines 65s. to £29, sugar cutter 12s., parallel vice 80s.

**SUTTON AND SONS, Reading, Berks.**

Collections of seeds and dried specimens, also growing specimens and paintings.

**SILVESTER, 3, Sheffield-street, London.**

Cow milker 10s. the set, siphon 1s. to 2s. 6d., tube cleaner 1s. to 21s., wringer 1s. to 3s. 6d., turnip cutter 1s. to 2s. 6d.

**TASKER AND SONS, Andover.**

Corn and other drills £30 10s. to £43, drill presser £15, sets of trussed beam harrows 3 gs. to 90s., suffle drags £5, winnower 10 gs., corn elevators 5 and 6 gs., eight-horse portable steam engine £233, thrashing machines £55 to £130, screw jack 2 gs., set of tubular iron whippletrees 14s.

**THOMAS, WM., Wellington, Somerset.**

Bricks 25s. to 40s. per 1000, drain pipes 3d. to 7d. each, and smaller bore 22s. 6d. to 90s. per 1000, roofing tiles 30s. to £8 10s. per 1000, chimney tops 2s. to 6s. each, vases 2s. to 6s., ridge tiles 2s. 6d. to 4s. 6d. per dozen, &c.

**TINKLER, R., Penrith.**

Various churns 70s. to £5 15s., hay and garden rakes 1s. 6d. each, winnower £9, horsehoe 75s. to 90s., land grubbers 70s. and 75s., double plough 94s.—Awarded second prize of four pounds for single-row grubber, and commended for single-row horsehoe for ridge and flat.

**TOPHAM, C., 31, Bush-lane, London.**

Sausage makers 10s. 6d. to 50s., masticators 12s. 6d. to 21s., dairy and domestic utensils 1s. upwards, tube brushes 1s. to 4s. 6d., grindstone and frame 3 gs., boot cleaner 3 gs.

**TROTTER, W., South Acomb, Northumberland.**

Flexible reaper £25, mower £20.

**TURNER, E. R. and F., Ipswich.**

Four-horse portable engine £161, crushing mills 3 gs. to £15 17s. 6d., corn mills £28 and £55, crane 25 10s., oilcake breakers 70s. and 95s.

**TURNER'S STRAP AND HOSE CO., Greenfield, Lancashire.**

Rolls of driving straps 2½d. to 8s. 7d. per lineal foot; leather hose 2s. 6d. per foot.

**TURNER AND CO., 13, Rose Terrace, Fulham Road, London, S.W.**

Sausage maker 17s. 6d. to 5 gs., masticator 15s., mincer 10s. 6d., washing machines 5 gs. to £9, kitchen dagger 1s.

**TUXFORD AND SONS, Boston.**

Portable steam engines—eight-horse £250, one-horse £80, two-horse £90, three-horse £115, ten-horse £270, twelve-horse £330, ten-horse farmer's self-propelling locomotive for cultivating and farm-yard purposes £400, ten-horse steeple engine £285, combined thrashing machine £120, straw elevator £48, portable mill £45, Appold's centrifugal pump £30 and £53, circular-saw table £20 and £28 10s., binding spring for holding deals 54s., circular-saws 50s. to £9, lifting jacks 30s. to 40s.

**TYE, JOHN, Lincoln.**

Corn mill 70s. and 145s., pearl barley mill 30s. 10s., smut machine 38s., crane for lifting millstones 6s., French burr millstones 8s., grey mill stones 90s. and 6s., mill chisels 1s. 3d. per lb.

**UNDERHILL, W. S., Newport, Salop.**

Turnip drill 95s., patching ditto 8s. 6d., ryegrass 70s., drill press 6s. 10s., horse-hoes 27s. 6d. and 33s. 6d., grubbers 50s. and 60s., lever horse rakes 6s. 10s. and 7 gs., six-horse portable steam engine 180s., combined thrashing machine 110s., combined sawing machine 95s., corn elevators 5 to 6 gs., cultivators 95s. to 8s., ploughs 55s. to 72s. 6d., harrows 52s. 6d. and 60s., hand cart 70s., sheep rack 35s. and 45s., sheep troughs 17s. 6d. and 28s., cow crib 34s. 6d., cattle trough 28s. 6d., sack barrows 10s. 6d. and 18s. 6d., cheese press 2 gs., varnish stove 36s., poultry and game fences 9d. to 2s. 6d. per yard, tree-guards 12s. to 24s. per dozen, standards for fence 6s. to 21s. per dozen.—Awarded silver medal for "Sketchley's" combined sawing, planing, moulding, and boring machine.

**VICKARY, J., Exe Island, Devon.**

Apparatus for small gas works 50s., recumbent gas bath 8s., meter 60s., gas cooking stove 4 to 6 gs.

**WAIDE, W., Leeds.**

Variety of churns, to make from 1 to 6lbs. 80s., to make 80lbs. 6s. 10s.

**WALLIS, HASLAM, AND STEVENS, Basingstoke, Hants.**

Corn drill 95s., turnip drill £39 11s. 6d., one-wheel steorage 95s., horse-rake £8 8s. 6d., eight-horse portable engine £230, thrashing and dressing machine £115, straw elevator £53, spring hanger 72s. 6d., spherical bearings 11s. and 26s. 6d., thrashing machines £40 and £80 7s., barley aveller 95s., corn dresser 10 gs., corn screens £3 17s. and £9, sack holders 25s. and 27s. 6d., sack holder and sack truck combined 43s. 6d., fixed gear two-wheel plough, £5 s. 6d., screw stump ditto 98s. 6d., "Excelsior" harrows 70s. to £8 10s., horse-hoe 45s., vertical lever drill £7 5s., screw ditto £9 5s., set of chain harrows 67s. 6d.

**WALTON AND CO., Worcester.**

Indiarubber wringer 22s. 6d., Canadian washer 7s. 6d., wool and waste washer 10 gs., washer and mangle 8 gs., wringer and mangle 3 gs., clothes dryer 38s., tent to hold 30 persons, closing like an umbrella, and weighing but 50 lbs., 25; road scraper £5 15s.

**WARREN, J., Maldon.**

Chaff-cutters 47s. 6d. to 11 gs., bean mills 3 and 6 gs., set of harrows and whippletrees 67s. 6d. and 80s., oilcake mills 3 gs., wood beam ploughs 52s. and 58s. 6d., other ploughs 2 gs. to £7 10s.

**WATTS, R. J., Plymouth.**

Elastic stitch cabinet and other sewing machines £9 to £13.

**WEBB AND SON, Combe, Suffolk.**

Assortment of leather machine bands, buckets, and hose, and of vulcanized indiarubber bands.—Commended for machine bands.

**WEBBER AND CO., Newton Abbots, Devon.**

Combined thrashing machine £38 and £105, reed comb 70s. and £5 10s., mortar mill £8.

**WEIR, E., 142 High Holborn, London.**

Spirit draining levels 30s. to 3 gs., workman's pendulum ditto 15s., chondrometer 35s. to 60s., pumps 5 to 8 gs., churns 25s. to 45s., milk test 1s., lactometer 6s., butter parser 10s. 6d. to 52s. 6d., butter whisks 10s. 6d. to 24s., washing machines, mincing and sausage-making machines, with samples of small mills to grind coffee, pepper, spice, &c.

**WESTERN COUNTIES MANURE COMPANY, Torpoint, Cornwall.**

Superphosphate of lime, guano, animal charcoal, bone, ammoniacal, and turnip manures.

**WEST AND CO., 4, Montague-mews North, London.**

Reaping machine £20, combined reaper and mower £20 and £15.

**WHEELER AND SON, Gloucester.**

Collection of agricultural seeds.

**WHIPPLE, E., Plymouth.**

Chaffcutters 50s. to £8 10s., lawn mower £8, turnip cutter 90s., oat and bean crusher 95s., self-setting perpetual mousetrap 2s. 6d., rotary washing machines &c. 8 to 12 gs., and variety of miscellaneous articles.

**WHITE AND CO., 29, Bedford-street, Strand, London.**

Earth closets for mechanically applying Monie's system of deodorizing and utilizing excrementitious matter by means of dry earth, portable apparatus in deal case 30s. to £9 10s. with partition showing supply of earth from behind.—Highly commended.

**WHITE, J., 7, Trinity-street, Southwark.**

Oil-feeders 1s. 3d. to 3s. 6d., artificial dams 2s. 6d. to 3s. each; driving belts; clothes wringers 12s. 6d. and 15s., pendons 1s. to 3s. 6d., hand-drill 4 gs.

**WHITEHEAD, J., Preston.**

Drainpipe, tile, and brick-making machine £21, solid-brick maker £36, brick presser 16 gs.

**WHITMEE AND CO., 70, John-street, Clerkenwell.**

Bean mill £2 15s., oat crusher £2 15s., corn crushers £4 to £20, linseed crusher £4 15s., corn mills £6 to £41, flour dresser £15, flour mills £6 10s. and £20.

**WILKINS, W. F., Ipswich.**

Five-horse portable engine £170, grinding mills £20 and £25.

**WILLIAMS, J. O., Torquay, Devon.**

Cooking apparatus 30s. to £31, yacht caboose £3 to 16 gs., boiling pot 12s., recoil wind guard 15s., ship stove £5 10s.

**WILLIAMSON BROTHERS, Kendal.**

Four-horse portable steam engine £130, vortex turbine £135, centrifugal pumps £28 and £42, whirlpool blowing-fan £21.

**WILLIARY, R., Preston.**

Continuous trough for cowhouse £2 4s. per lineal yard, food apparatus £25.

**WITHERINGTON, T., Foregate-street, Worcester.**

Medicine chests, sheep powder, articles for toilet use, cattle medicines, and sheep-dipping composition.

**WOOD, W. A., 77, Upper Thames-street, London.**

Two-horse grass-mowers (three specimens) £22, one-horse reaper £18, self-raking side-delivery reaper £28, combined mower and reaper £25.—Awarded first prize of ten pounds for the two-horse grass-mowing machine, the second prize of seven pounds for combined mower and reaper, and first prize of nine pounds for one-horse reaping machine.

**WOODS AND COCKEDGE, Stowmarket.**

Corn mills £28 10s. to £75, "universal" mills £7 10s. to £15, crushing mills £5 10s. to £15, stable mill £5 15s., bean mill £3 15s., turnip cutters £4 10s. and £5 10s., root pulpers

£8 12s. 6d. to £5, oilcake breakers £3 12s. 6d. to £3 15s., poppy extirpator £8 15s., two-horse thrashing machine £37, one-horse carts 10 gs. to £15 10s., two-horse cart £16, horse powers £10 to 16 gs., two-horse mower £22, one-horse reaper £18, asphalt apparatus £17, four-horse vertical steam engine £110.—Awarded second prize of three pounds for single-horse cart.

**WORTH AND PONTIFEX, 293, Oxford-street, London.**

Knife cleaner 2 gs., barrel stand 8s., fork cleaner 2s., razor stop 3s., churns 18s. to 25s., milk pails 7s. 6d. and 12s. 6d., yoke 10s. 6d., bread-cutting machine, burglary preventor, boot and shoe cleaner, &c.

**WRAY AND SON, Bedale.**

Two-horse reaper £15, mower £19, one-horse reaper £15, combined reaper and mower £25.

**WRIGHT, J., Sandford, Devon.**

Drill for small seeds 50s., horsehoes 2 gs. and 45s., grabber 40s., self-delivery reaper £20, one-horse reaper £18, horse-rakes £7 and £7 10s., ploughs 75s. to £5 10s., sheep rack on wheels 65s., drags and whippetrees 15s.

**WRIGHT, H., Boston.**

Stacking machine £35, straw elevator £35.

**WRIGHT, C. T. AND N. T., Boston.**

Straw elevator £35.

## THE IMPLEMENTS AT PLYMOUTH.

As far as the trials of reapers are concerned, little requires to be added to the account which appeared in our columns on July 17, and brought down the proceedings to the previous Saturday night. The judges were early in the field on the Monday, hoping to get through everything in time for a peep at the stock on Tuesday. The first business was to test the "selected" combined reapers and mowers upon the heavy oats, and then on the lighter rye. Wood's did its work well, the drop slat-platform being of great assistance in the delivery of the rye. There is no provision for delivering the sheaves at one side. If these trials are to be considered decisive, and sufficiently trustworthy to guide purchasers to the best machines, this is no doubt one of the best for the farmer's money, the judges having awarded it what may be called "the second" prize of £7. Hornsby's combined machine took the chief prize of £8, and certainly showed great capabilities in both the light and heavy crop; the main point about it is that, as in some other machines not so well constructed as this, two men have seats provided for them, one driving the horses, and the other having only to attend to the delivery of the sheaves with his rake. Bamlett's two-horse combined reaper and mower did not work to equal advantage, but did its cutting extremely well, and came in for a prize of £5. Kearaley's two-horse combined machine made a decidedly inferior performance in comparison with the former machines, but still was considered sufficiently meritorious to deserve a high commendation; and a commendation was awarded to Barber's combined machine, in which the sheaves are pushed off at the side. This machine would bear considerable improvement in make and finish of its parts. On the whole, we are not very favourably impressed with this class of machines: they may answer for a grass district where a small proportion of corn is grown; but, at present, the public will exercise a discretion by purchasing strong grass-mowers for heavy hay, and strong reapers for good grain crops, a system that will pay far better both in quantity and quality of work done, and more especially in the item of repairs, than attempting to get too much out of one implement.

The selected manual-delivery machines were tried again, and then several were tested by the dynamometer, lightness of draught being in favour of Wood and Samuelson.

In the class of one-horse reapers Wood's machine, with back-delivery slat-platform, very deservedly took the first prize of £9, as this is an implement thoroughly "proved" on the farm. The second prize of £7 went to Samuelson's "Eclipse" reaper, with tipping zinc-covered platform for back delivery, and no intermediate driving-shaft, the very simplest of all in respect to moving parts. Hornsby's machine came in for the third prize of £5; the cutting was excellent, and the drop-platform for back delivery is made of slats, with their under-edges bevelled, so as to collect more projecting stubbles in the slits for catching and delivering the sheaf upon the ground. The dividing iron is specially adapted for keeping the standing corn off the cut sheaf. Cuthbert's machine received only a "high commendation," though its work was universally acknowledged to be very good. The judges seem to have laid down the principle that their awards must be to the machines, and not to the men working them; and they thus made up their minds that Cuthbert is the cleverest rake-man in England; so that by consequence, his unequalled performance was due mainly to his personal skill and address, and but little to his machine. The main merits of this consist in the strength of its construction just in those parts that long field-practice has gradually improved. The platform, for either back or side delivery, is simply a flat board, with the addition of a small friction-roller at the back; and in light crops perhaps a tipping platform would be decidedly better; but for delivering very heavy crops, nothing can surpass the plain immovable board. Page, Picksley and Sims, Dicker, Bowhay, and Bamlett did work calling for no special remark. In the class of two-horse manual delivery reapers, the first prize of £10 was won by Hornsby and Sons' new machine, in which the man picks up and divides with his rake, and drops a slat platform with the sheaf upon a lower platform having endless chains that deliver the sheaf at the side. We need not say more than we have already done concerning this novel and most valuable invention, except that this decision of the judges is fully consistent both with the actual performance of the machine, more particularly upon the rye, and the great facilities which it promises in the harvesting of crops in very varied conditions. Hornsby's grated drop-platform reaper, with back delivery only, takes the second prize of £6; and an equal prize is

awarded to Pickaley and Sims' "Champion" reaper, with shafts, large main-wheel, pendulum along for the connecting-rod end of the knife-bar, and the back half of the platform made to drop, but balanced by a weighted lever. Among the novel ideas in this class was noticeable Brenton's roller-delivery. The cut corn falls upon a transverse roller of about eight inches diameter, made of wood, with numerous small iron staples, forming so many short pegs, upon its surface. This roller is ordinarily at rest; but when a sheaf has to be delivered the man's foot depresses a treadle, and the other end of the lever raises one end of the roller, which carries a small plain wood rigger: this rigger being thus pressed against a corresponding plain wheel on the axis of the main driving-wheel, causes the roller to rotate and carry over the sheaf, which it delivers behind. The trial upon moist corn did not succeed, the operation being better performed, however, on the Mouday. Another machine of this maker, but not brought out, we believe, to the trial field, has a quadrant-shaped platform with a conical roller, intended to act as a side delivery.

The £40 for self-side-delivering machines is divided into two sums of £25 and £15 each, the former going to Hornsby and Sons, and the latter to Samuelson. The concluding competition in this class was between Wood's, Samuelson's, and Burgess and Key's side sheaf-delivery reapers, and Hornsby's swathe-delivery machine, the Beverley Company's swathe-delivering machine having been withdrawn. Hornsby's swathe-delivery first prize reaper did not manage the heavy oats at all well, but the rye was laid beautifully, the cut in both cases being first-rate. The machine is somewhat like Lord Kinnaird's improvement of Bell, the corn falling, however, on a fixed inclined platform with horizontal endless chains passing across it, instead of upon a cloth web, as in the Scotch machine. If the dividing iron is right, and there is a sufficiently wide "throat" for a heavy strawed crop to come off the chains, this is a very good machine. We are of opinion, however, that had the Beverley Company displayed a little more address in their manipulation, for it does want a man with a head-piece to hold the steerage-pole, their lately improved machine, would have made a better figure at Plymouth, and have shown the full advantages derivable from a first-class swathing reaper. Burgess and Key's sheaf-delivery machine cut well, but delivered badly-formed sheaves: the action of the rake appearing too sudden, and the motion

not sufficiently smooth and quiet, at least for very heavy crops. Wood's self-raking-off reaper began in good style, but the rake arm on the vertical spindle, which drives the reel, of five flyers, is somewhat weakly designed, although it enters the crop at the side, and sweeps the platform in the right direction, and therefore is good in idea. Samuelson's machine, with automatic rakes to reel-boards, revolving windmill-fashion, but in a generally horizontal direction, did its work in a more creditable manner; the slow motion of the rakes enabling them to deliver the sheaf-bunches in a tolerably neat style, though not so well as they are laid by a manual-delivery machine. Two of the Banbury reapers were tried; the prize going to the lately improved and cheaper of the two—the price £30. The axis of the rakes is slightly inclined from the upright, leaning a little towards the platform, the tilt of the rake-arms in their rotation being regulated by an irregularly-shaped circular cam; and instead of being driven by an endless chain, as in the old machine, they receive motion by means of a shaft with bevel wheel and pinion directly from the intermediate shaft which drives the crank. There is a quadrant bracket for setting the machine at any requisite height from the ground without disarranging the gear of the main spur-wheel and pinion on the intermediate shaft.

A question has been mooted whether or not the Society should in future prescribe what it means by a "one-horse," and what by a "two-horse" machine. Most of the machines exhibited under the former category are capable of taking about as wide a cut as those under the latter denomination; the drivers simply taking a portion of their breadth where the crop is heavy. Some critics observed that the useless knives were taking up motive power to drive them; others said that these spare knives are wanted for catching odd straws that lean over away from the crop. A suggestion has been made that the Society should limit one-horse machines to a finger-bar of say four feet in length; but this hardly serves a practical notion, for if any maker can bring out a machine that will cut a breadth of six feet, and yet be of moderate draught for one horse, why should not he?

The dynamometer draughts of the selected grass-mowers and reapers will appear in due course in the Royal Agricultural Society of England's *Journal*; but we here give in a tabular form certain points as furnished us by some of the makers.

PARTICULARS OF GRASS MOWERS AT PLYMOUTH.

	Picksley and Sims' 2-Horse Mower.	Hornsby and Sons' Mower.	Wood's Mower.	Burgess and Key's New Mower.	Samuelson & Co's Mowers.
Number of revolutions of crank for each lineal yard advanced by the machine .....	10	12	11	11	10½
Length of stroke of the knife-bar .....	3 inches.	2½ inches.	2½ inches.	2½ inches.	3 inches.
Breadth of a knife along the bar .....	3 inches.	3 inches.	3 inches.	3 inches.	3 inches.
Length of a knife from the bar to the point .....	2½ inches.	2 3-16th inches.	1½ inches.	1½ inches.	2½ inches.
Distance apart of the fingers, centre to centre .....	3 inches.	3 inches.	3 inches.	3 inches.	3 inches.
Knives plain or serrated .....	plain.	plain.	plain.	plain.	plain.
Width of cut .....	4½ feet.	4½ feet.	4 feet 3 inches.	4 feet 3 inches.	4 feet.
Total breadth of machine, out to out .....	9 feet 1 inch with bar down, 4 feet 7 inches with bar raised.	9 feet at work, 4½ feet turned up.	7 feet 10 inches at work, 4 ft. travelling.	8 feet when cutting, 4½ feet when travelling.	Has a folding beam for travelling.
Weight of machine .....	about 8 cwt.	7 cwt.	5½ cwt.	6 cwt.	5 cwt.
Shafts or pole .....	pole.	pole.	pole.	pole.	pole.
Price .....	£22	£22	£20, with extras £22.	£20 delivered to any railway station in England.	£20.

## PARTICULARS OF MANUAL REAPING MACHINES AT PLYMOUTH.

	Picksley and Sims' 2-Horse Reaper.	Hornsby and Sons' New 2- Horse Reaper.	Hornsby and Sons' New 1- Horse Reaper.	Hornsby and Sons' 1-Horse Reaper.	Wood's 1-Horse Reaper.	Samuelson and Co.'s 1-Horse Reaper.	Cuthbert and Co.'s 1 or 2- Horse Reaper.
Number of revolutions of crank for each lineal yard advanced by the machine ...	7½	8	8	8	7½	4½	6½
Length of stroke of the knife-bar ...	3 inches	3 inches	3 inches	3 inches	3 inches	6 inches	3½ inches
Breadth of a knife along the bar ...	3 inches	3 inches	3 inches	3 inches	3 inches	3 inches	3 inches
Length of a knife from the bar to the point	2½ inches	2½ inches	2½ inches	2½ inches	1½ inches	2½ inches	3½ inches
Distance apart of the fingers, centre to centre	3 inches	3 inches	3 inches	3 inches	3 inches	3 inches	3 inches
Knives plain or serra- ted	plain	plain	plain	plain	plain	plain	plain
Width of cut	5 feet 8½ inches	5 feet	4½ feet	5 feet	4 feet 8 inches	5 feet	5 feet
Total breadth of ma- chine out to out ...	9 feet 3 inches	8 feet	7 feet	8 feet	8 feet 4 inches	7 feet 6 inches	7 feet 10 inches
Weight of machine...	9 cwt.	8½ cwt.	6½ cwt.	5 cwt.	4½ cwt.	5½ cwt.	9 cwt.
Shafts or pole	pole or shafts to order	pole	shafts	shafts	shafts	shafts	shafts
With or without reel	no reel	no reel	no reel	no reel	no reel	no reel	no reel
Mode of delivery	Balanced tip- ping platform	Tipping plat- form and endless-chains on a lower fixed platform	Tipping plat- form and endless-chains on a lower fixed platform	Patent grated drop platform	Drop skeleton platform	Tipping plat- form	Fixed flat plat- form with friction roller behind
Side or back delivery	Sheaves at the back	Sheaves at the side	Sheaves at the side	Sheaves at the back	Sheaves at the back	Sheaves at the back	Sheaves at the back or side
Price	With shafts £21, with pole £22 10s	£23	£19 19s.	£16 16s.	£16 10s., with extras £18	£16 10s.	£22, or £24

## PARTICULARS OF SELF-DELIVERY REAPING MACHINES AT PLYMOUTH.

	Hornsby & Son's 2-Horse Reaper.	Wood's 2-Horse Reaper.	Burgess & Key's New Machine.	Samuelson and Co.'s ditto.	Beverley Iron & Waggon Com- pany's New 2-Horse Machine	Beverley Company's 3-Horse Machine.
Number of revolutions of crank for each lineal yard advanced by the machine ...	8	6	7	4½	5½	5½
Length of stroke of the knife-bar ...	3 inches	3 inches	2½ inches	6 inches	3 inches	3 inches
Breadth of a knife along the bar ...	3 inches	3 inches	3 inches	3 inches	3 inches	3 inches
Length of a knife from the bar to the point	2½ inches	1½ inches	2½ inches	2½ inches	2½ inches	2½ inches
Distance apart of the fingers, centre to centre	3 inches	3 inches	3 inches	3 inches	3 inches	3 inches
Knives plain or serra- ted	plain	plain	plain	plain	serrated	serrated
Width of cut	5 feet	5 feet 3 inches	5 feet	5 feet	5 feet 9 inches	8 feet 3 inches
Total breadth of ma- chine out to out ...	8 feet	9 feet 4 inches	7 feet 6 inches	7 feet 9 inches	6 feet 9 inches	9 feet
Weight of machine ...	10½ cwt.	7½ cwt.	11 cwt.	10 cwt.	13 cwt.	15½ cwt.
Shafts or pole	pole	pole	reel	pole no reel	reel	shafts reel
With or without keel	reel	reel	reel	no reel	reel	reel
Mode of delivery	Endless chains passing across a fixed sloping platform	Rotary rake, hinged upon a vertical spindle	Rotating rake upon the reel, with sweep- ing movement across the platform.	Revolving rakes	Endless belts, passing across a fixed sloping platform	Endless belts, passing across a fixed sloping platform
Side, back, sheaf, or swathe delivery	Swathe, at one side	Sheaves at side, the number per minute delayed at pleasure	Sheaves at the side	Sheaves, or swathe, at the side	Swathe, at either side as required	Swathe, at either side as required
Price	£34.	£26 10s., with extras £23.	£34.	£30.	£37, with two complete knife- bars and six extra cutters, etc.	£42, with two complete knife- bars and six extra cutters, etc.

Amongst the haymaking machines and horse-rakes it is noteworthy that Messrs. J. & F. Howard cleared off all the prizes they "went in" for: that is, out of the £15 offered for haymakers, they took £6 for one machine and £5 for another; and out of the £10 offered for horse-rakes, they won £6 for the new rake sent out by the Britannia Works. The first-prize Bedford haymaker has really all the improvements of the Leeds prize machine—including the eccentric motion for instantly reversing the action, without having to make adjustments at both ends of the machine; it works most effectively, both as a tedder and turner, and without the possibility of clogging; yet the selling price is only eleven guineas. The second-prize larger-sized machine is the old one with several improvements—as a solid steel spindle in place of the tubular axle; the reversing of the action is accomplished at one movement, without touching the rakes; and the springs are inserted in lots without being weakened by holes through them.

The Bedford horse-rake has been much improved by giving the teeth a larger sweep, and a larger leverage for rising over obstacles when in work; and to secure greater lightness for lifting while preserving the same strength as before, the steel teeth are rolled tapering, that is, slightly decreasing in thickness all the way from the hinge end to the point, where the tooth is only half an inch thick. The raising is effected by sinking the hinge bar, the main axle forming the fulcrum; and the curve of the back and lower part of the teeth is concentric with this axle as a centre, so that the teeth have no tendency to lift up the hay when rising. An easy bell-crank lever arrangement enables the teeth to be easily lifted by the hand, and to keep up when lifted, without any catch or hook. Messrs. Howard have brought out the best arrangement we have seen of a seat upon a horse-rake, with hand levers for ready-lifting of the teeth. This is well adapted for hot countries, but will scarcely be much patronized by farmers at home.

Boby's third-prize haymaker is an admirably-made tool, extremely simple in the working parts, and upon wheels of well-seasoned wood. Mr. Nicholson's haymaker receives a high commendation. This machine, excepting improvements in a few details, won the first prize at the Salisbury meeting, is peculiarly efficient, with extremely simple gear for driving both the forward and the back action, and defies any crop to clog it or wrap upon the barrels. Mr. Nicholson has a number of clever diagrams, showing the cycloidal track of the teeth and the frequency of the points of contact with the ground (or the crop) in the case of his own and other first-class machines, from which, according to theory, the Newark machine ought to beat all others hollow. It did not appear, however, during the trials accorded to the several machines, that this did more tossing and separating of the grass or that it turned the tedded hay more efficiently than others. The late improvements consist of a small eccentric for altering the pitch of the shafts; a better form of fork-barrel, with a hollow fitting the axle-casing, to preclude the possibility of any wrapping and clogging. Mr. Nicholson has brought out a ten-guinea horse-rake having the back-action only. This new machine has an adjustable seat for the driver. A. and T. Fry receive a commendation for Grace's new haymaker, with disc or solid wheels, and the axis so placed as to relieve the horse's back of pressure, the man partly balancing by riding; the cage, however, is in one revolving piece—giving far less advantage than with a division. Ashby and Jeffery have still farther improved their original haymaker, which has, in its day, won so many prizes. Without any complication, the forks are so contrived that their velocity may be increased or diminished at the pleasure of the operator—a valuable facility for suiting all sorts and conditions of grass.

The springs also have considerably greater power than in previous machines. This firm also makes a fourteen-guinea haymaker, with zig-zag arrangement of forks and reversing motion; and their eleven-guinea machine, of six inches' less breadth, works both ways, but with the forks in a single revolving cage. Among other hay machines that struck our notice were Huxtable's light skeleton machine, with crank axle for setting at different heights, but with only one-way action; as also Cranston's "kicking" hay-tedder, the great merit of which is its lightness of draught, and its action being under complete control of the driver on his seat, without stopping "the pony;" for it has the recommendation of not requiring so much as a horse to work it.

The second prize for horse-rakes was awarded to Page and Co, of Bedford, their implement being well-constructed, simple and effectual in principle, and with oval steel teeth. The breadth taken at one time is 7 feet 9 inches, and the price low.

### THE IMPLEMENT YARD.

Notwithstanding previous announcements in hopeful newspapers, nobody expected to find a heavy show of mechanism down at the sea-coast of Devonshire. The figures tell us that while Leeds had 5,488, Battersea 5,064, and Worcester 5,839 implements, Newcastle last year had 4,024, and Plymouth just one less. All the great makers were represented in the show. Bentall had a fine show of chaff-cutters, mills, and pulpers. Coleman and Morton exhibited their steam-cultivating apparatus, prize cultivators, and rotary potato-digger. The Reading Iron-works Company showed their fixed steam-engine, chaff-cutters, thrashing-machines. Tasker and Sons showed drills, and Seaman's trussed-beam harrows. Blackburn's traction-engine was a singular feature in the machinery-in-motion department; the boiler upon small wheels running on a sort of endless tramway inside a large drum, while the steam cylinders and gear-work are upon an external frame. A large diameter and great bearing-surface are attained by this manner of construction; but modern practice points to economizing weight, and keeping the steam hot, as two sources of success in designing "tractor" engines. Carson and Toone showed prize horse-hoes, and single-row grubbers, unequalled for strength and efficiency. The Beverley Iron and Waggon Company came out with their usual strength in machine-made carts and waggons for all purposes, prize one-horse carts with "tips," harvest-carts, and sets of patent wheels. Woods and Cockedge showed mills, weed extirpators, and the horse-powers for which they are famous. Eaton and Sons exhibited horse-hoes, and their prize revolving turnip-thinner. J. and F. Howard had a fine stand of haymakers, ploughs, their certainly unequalled ridging and potato ploughs, ploughs with the new "digging breasts," flexible chain-harrows, and their apparatus for steam cultivation. The new traction-engine, having the boiler placed transversely upon a three-wheeled frame, displayed its facilities of turning, and ascending and descending inclines. These engines are specially applicable for contract companies, to work on the double-engine system, hauling the implement to and fro by a single line of rope. For ordinary farm-use, the stationary windlass, with two winding drums, was exhibited. Ransomes and Sims had a great display of Newcastle prize ploughs, corn screens, mills, their steam engines and thrashing machines. One novelty here was the semicircular whippetree, invented by Mr. Edmunds, of Rugby: the foot-chain is attached by a friction-roller, which, running at liberty within the semicircular back of the whippetree, changes its place according to the position of the whippetree, thus

always preserving an equal strain upon each horse; and the judges honoured this invention with a silver medal. On the next stand was Phillips' "rotary spader," invented by "Cicero Comstock," of America. A very ingenious combination of mechanical motions is employed to direct a number of tines properly into the ground, and again to adjust their position on emerging with the broken earth. Drawn by four horses, this barrel of spikes proposes to dig eight inches deep and three feet wide; but it was not taken out, we believe, to the trial-field. The construction is of nothing like so strong a character as that of Samuelson's rotary forker. Reeves had a large show of drills, water-drills and manure distributors. Clay showed his cultivators and weed eradicators, with a wonderfully simple and good ridge horse-hoe, which can be set to different widths without stopping the horse for the purpose. Ireland's three-motion churn is a clever thing, accomplishing a great deal of dashing with very few moving parts. Page and Co. had a good stand of horse-rakes, chaff-cutters, and ploughs. Whitehead exhibited his drain-pipe, brick, and tile machines. Amies, Barford, and Co. had an extensive entry of water-ballasting rollers, water-ballasting adjustable garden rollers—the framing of the lightest kind, and the friction and wear on the bearings reduced to a minimum; also the farmer's steam cooking-apparatus, and the Felton American corn-grinding mill. Mellard's new cheese-making apparatus, invented by Mr. Pugh, of Uttoxeter, deservedly came in for a silver medal. We had supposed that nothing could surpass Koevil's invention; but here we have numerous points of improvement in cutting, gathering, pressing, and vatting curds, altogether by far the cleverest, most hardy, and valuable contrivances we have yet seen for a great cheese dairy. Sharman shows the use of galvanized and tubular iron in hand rakes, corn bins, and vessels. Ball exhibited ploughs and carts. Childs sent the California lifting and force pump, a neat contrivance, with ample provision for the passage of solid bodies through the valves. Mapplebeck and Lowe had a large assortment of chaff-cutters of their own manufacture, a great variety of agricultural articles, and an interesting collection of models. Priest and Woolnough showed their drills and horse-hoes. Skelton's turnwrest plough, well named "The Butter-fly", is a remarkably ingenious tool: one mouldboard is advanced and the other retired, the share turned over, the sideways adjustment given to the coulters, and the land and furrow wheels set at liberty and refixed in the new position, all by a single movement of the ploughman's hand. Another turn of a handle puts the skim-coulter from right to left-hand action. Tinkler exhibited churns of all sizes. Wallis, Haslam, and Co., showed steam thrashing-machines, dressing-machines, and sack-holders. Garrett and Son showed portable steam-engines and thrashing-machines, with a great novelty in the form of a machine for reducing straw to a soft mass, for rendering it more easily digestible—probably this may introduce a more profitable economy of straw food into English agriculture. The machine requires to be driven by an 8-horse engine; but it is very likely that a more rapid rate of performance will be attained by gradual improvements in the friction-drum and concave, by which the straw is torn into small shreds. Peirce showed a capital assortment of japanned wrought-iron troughs, the best possible for all sorts of stock to feed out of. Richmond and Chandler had a large number of chaff-cutters. Bradford contributed a great show of washing machines. Plimsaul Brothers had the largest stand in the yard, comprising a vast variety of agricultural and horticultural implements and tools. Boby showed his well-known corn-screens, and haymakers. Pickley and Sims exhibited among numerous other articles

a new chaff-cutter, which cuts two different lengths of chaff without changing the wheels, and also a really good gorse-cutting and bruising machine for preparing this valuable and cheap produce for horse and cattle food. On Brinsmead's stand was a "synchronical thrashing and reed-making machine," that is, a machine for stripping out grain from the ears, while leaving the straw unbroken for thatch; also a child's self-exercising nursery chair, a chair mounted upon a wood spring, giving it a dancing motion. John Fowler and Co. exhibited their steam-ploughing and cultivating machinery, and a 10-horse traction-engine, admirably designed, very powerful, with the bearings all covered from dirt, and easily oiled while the engine is in motion. Hornsby and Sons had a large stand of drills, ploughs, pulpers, and washing-machines. Burgess and Key exhibited reapers and mowers, pumps, American churns, and a number of domestic articles. On Holmes' stand was Mr. Everett's new rotary harrow or twitch-extirpator, a sort of adaptation of the haymaker cage to the work of forking: in the trial-field we believe this tossed the soil about well, and received from the judges a silver medal. The price is exceedingly low. Willary's method of supplying a continuous cattle trough with cake and turnips, falling broken or cut from a travelling machine, is very ingenious; but we think scarcely a practical motion, at least in its present form: in exceedingly large feeding establishments it might answer. Allen's twelve-horse expansive portable engine excited considerable attention, owing to the simplicity of the means by which it economizes a vast proportion of coal and water. Tuxford and Sons had a fine show of their prize portable engines of various powers, from twelve-horse down to a one-horse engine—just the thing now wanted for various light processes of the barn and feeding-house. Wright showed a novel straw-carrier, which feeds itself with straw and conveys it to any distance and height, in any direction—requiring, however, much previous fixing and after-removal, when only a single day's thrashing is concerned. Clayton, Shuttleworth, and Co. exhibited portable engines and thrashing-machines. Robey showed portable steam-engines. Brown and May showed steam-engines and pumps. Ruston, Procton, and Co. had portable engines, thrashing-machines, and saw-benches. Barrows and Carmichael exhibited a thrashing-machine with a spring table-shaker, and vibrating-board driven by a single crank-shaft. Webber and Co. had a thrashing-machine without a vibrating-board, the corn being conveyed along a fixed board by means of scrapers under the shaker-boxes. Maynard showed his sifting chaff-engine, with four knives—the most powerful chaff-cutter in use. Riches and Watts sent the American grist mill. Aveling and Porter had a couple of traction engines, with the disc wheel ready steerage, and light pitch-chain driving gear. These engines travelled upon common roads all the way from Rochester in Kent, accomplishing the long journey in six days.

The department of seeds and models comprised Neighbour's popular beehives; the display of seeds, roots, cereal specimens and samples, of Thomas Gibbs and Co.; a fine stall of seeds and roots of Sutton and Sons; another show of seeds by James Carter and Co.; Harvey's powder for killing wire-worms; and Raynbird's samples of cereals.

MONTHLY COUNCIL.—*Wednesday, August 2, 1865*; present, Lord Tredegar, President, in the chair, Lord Chesham, Major-Gen. the Hon. A. N. Hood, Mr. Arkwright, Mr. Raymond Barker, Mr. Cantrell, Colonel Challoner, Mr. Claydon, Mr. Brandreth Gibbs, Mr. Holland, M.P., Mr. Randell, Mr. Sanday, Mr. Shuttleworth,

Mr. Thompson, Mr. Torr, Mr. Wells, Mr. Frere, and Professor Simonds.

**FINANCES.**—Major-Gen. the Hon. A. N. Hood, chairman of the committee, presented the report, from which it appeared that the Secretary's receipts during the past month had been examined by the Committee, and by Messrs. Quilter, Ball, and Co., the Society's accountants, and were found correct. The balance in the hands of the bankers on July 31 was £7,497 16s. The Committee recommended that the money now on deposit (£1,000) be withdrawn to meet the Plymouth expenses. This report was adopted.

**JOURNAL COMMITTEE.**—Mr. Thompson reported that in Class II. the only Essay sent in was not considered deserving of the prize.

In Class V. the prize of £25 is awarded to the Essay bearing the motto "Suum Cuique," written by Wm. Henry Heywood, Dunham Massey, Altrincham, Cheshire. The Essay 564, by W. T. Carrington, Hallington, Uttoxeter, is Commended.

In Class VII. the prize of £20 is awarded to the Essay bearing the motto "Rufus," written by A. Bailey Denton, Stevenage. The Essays 566, by John Ewart, Bigg Market, Newcastle-on-Tyne, and 568, by Philip D. Tuckett, 76, Old Broad-street, are commended.

In Class IX. the prize of £10 is awarded to the Essay bearing the motto "Anteveni, et subolum," &c., written by William Little, Bunker Hill, Lambton Fence Houses; and No. 579, written by G. Murray, Overstone, Northampton, is commended.

The following list of subjects was recommended for Prize Essays for 1866:—

	£
1. County Essay, Worcestershire ... ..	50
2. ditto Leicestershire ... ..	50
3. Town Dairies, especially with reference to the Prevalence of Disease ... ..	25
4. Mountain herds of Sheep: pure or crosses ... ..	20
5. Leaves of Plants; power of resisting drought ... ..	20
6. Improvements of Waste Lands in connection with Mines ... ..	15
7. On the use to a Farmer of Magnifying Glass or simple Microscope ... ..	15
8. Any other Agricultural subject ... ..	10

Recommended that the Shorthorn, Hereford, and Devon Herd-books to the present time be purchased for the Library.

This report was adopted.

**VETERINARY.**—The following are extracts from the report of the Governors of the Royal Veterinary College for the year ending 31st December, 1864:—

During this period all the means at the command of the College were kept in full operation, the lectures, demonstrations, chemical instructions, &c., being daily delivered so soon as the scholastic session commenced, viz., in the month of October, according to established custom.

The chief subjects treated of in the lectures on Cattle Pathology, after the necessary introductory ones, were the physical and vital properties of the blood, with the pathological changes it undergoes in inflammation and other morbid conditions of the body.

This section of the instructions included likewise a full description of the causes, symptoms, and treatment—prophylactic and curative—of the diseases commonly known as Redwater in cattle and sheep, Blackleg, or Quarter Garget, Splenic Apoplexy, Diabetes, Purpura, &c., together with the results of inflammation, such as effusion, suppuration, adhesion, ulceration, and mortification.

The number of pupils in attendance was larger than ordinary, no less than fifty-eight "freshmen" entering between October and the commencement of the Christmas vacation.

The yearly increasing entries of pupils, with the extended instructions and more rigid examination, bids fair to elevate the profession, and to keep the country well supplied with scientific

veterinary surgeons on whom the agriculturists can confidently rely at the time of need.

The Bovine animals admitted into the infirmary have afforded useful instruction of a practical nature, although the cases of disease have not been of any uncommon kind. One case, however, of disease of the eyeball, requiring the performance of a bold but delicate operation, very rarely had recourse to in the lower animals, was successfully undertaken, the result proving most satisfactory. Another complex case of disease of the womb, associated with an accumulation of purulent matter within the organ, also required a surgical operation, the performance of which was attended with the happiest result. These two cases are only alluded to for the purpose of showing that operations requiring an accurate knowledge of anatomy are among many others brought before the notice of the pupils, on which occasions every step of the process is fully explained to them.

The number of morbid specimens received from country veterinary surgeons and others has been fully equal to any former period of the like duration; and these also, according to the established custom, have been used for the benefit of the class. Many of them have possessed novel features; and, as such, a selection has been made for publishing in the *Veterinaria* the particulars of the cases in which they occurred.

The governors are fully alive to the necessity which exists for the strict investigation of every new or modified form of disease which may show itself among the animals of the farm, and they only require the cordial co-operation of the members of the Society to enable them to accomplish this desirable object, and apply the knowledge obtained to the practical advantage of the agriculturists themselves.

Many members of the Society continue to consult the professor of cattle pathology in cases of serious outbreaks of disease; and the governors have learnt with much satisfaction that his visits into the country during the past half-year, for the purpose of studying the causes, with a view of arresting the progress of disease, as well as the instructions given for the treatment of infected animals, have, as a rule, been followed by beneficial results.

In the report for last year, mention was made of a series of experiments being instituted in order to elucidate much of the mystery which still surrounds the existence of parasites within the animal body. This intricate and important inquiry is still going on; and several of the facts arrived at have already been used with advantage, both in freeing animals from parasites and in warding-off their attacks.

The following letter from Professor Simonds was read, and directed to be published:—

"Royal Veterinary College, Aug. 1, 1865:

"To the Council of the Royal Agricultural Society.—I have to report that the disease which has recently made its appearance among cattle continues to extend its ravages, and that, since my last report, several more of the London dairies have become the seat of the malady.

"Besides this, the disease has also shown itself in different parts of the country, as, for example, in Shropshire, Suffolk, Norfolk, and Sussex. In each of these instances, although the places are far removed from each other, the cause of the outbreak can be clearly traced to the introduction of animals in whose systems the disease was incubated. The facts I am in possession of give no support to the opinion that the malady has had a spontaneous origin in this country, but that it has been introduced from abroad, by the importation of foreign cattle.

"I have also to report that I am in daily communication with the Government, who have adopted a system of inspection of the diseased cattle within the boundary of the metropolitan police, to keep in check the progress of the malady, and who, I have reason to believe, will transmit without delay some suggestions for the consideration of the council, having the same object in view.

"JAMES B. SIMONDS."

The committee recommended the usual grant of £200 to the Royal Veterinary College for the year 1865. This report was adopted.

It was moved by Mr. Holland, M.P., and seconded by Major-general the Hon. A. N. Hood, that the Veterinary Committee may meet (if summoned by the chairman) from time to time between this meeting and the Novem-

ber council, and that the committee be empowered to take such steps as they may consider necessary in reference to the cattle plague and small-pox among sheep.

**MEETING AT BURY, IN 1866.**—It was arranged that the following members of the Bury committee should proceed at once to Bury St. Edmunds, and make arrangements, viz., Lord Tredegar, Sir Edward Kerrison, Mr. Brandreth Gibbs, Mr. Randell, and Mr. Sanday.

**SHOW-YARD CONTRACT.**—Mr. Randell presented the following report:—

Your Committee have to report, that acting upon the recommendation of the surveyor at Plymouth, they agreed to purchase from Mr. Manning such offices and other articles as were well adapted to their several purposes, a list of which, with prices annexed, is appended to the Surveyor's report. It will be seen that certain offices are purchased for £457, the annual charge for the use of which has been (including cost of transit and fixing), £378; other things are purchased at a cost of £177 2s., making the total £634 2s.

The charges for the use of the latter cannot be accurately stated, they having formed part of other charges; but as the annual cost of such of the offices as have been separately charged for has been 80 per cent. of value, it may be inferred that the Council have paid liberally for the use of the remainder. Carrying out the principle that the permanent offices should belong to the Society, the contract for next year should provide that the entrances (which we hope to see an improvement upon the old ones), the office for Council and Secretary, with any other building of the sort which may be found necessary, shall be retained, thus leaving for future years only the temporary erections to be contracted for.

As no inventory of the Society's plant was to be had at Plymouth, your Committee requested Mr. Manning to have the whole, with that now purchased from him, carefully packed and removed to Bury St. Edmunds, furnishing the Council with an inventory of everything, which he promised to do. The Surveyor will attend to its disposal at Bury.

The Surveyor reports upon Mr. Manning's bill for work at Plymouth, that the portion to which the schedule of prices agreed upon in 1862 applies amounts to £2,076 1s. 4d., the value being £2,693 19s. 7d., excess £282 1s. 9d.; other works not provided for by any agreement as to prices, £502 3s. 8d., the value £380 10s. 8d., excess £121 13s.; supplemental bill, £59 5s. 6d., the value £43 5s. 6d., excess £16; total amount success of the value of work, including certain extra charges which should form part of measured work at stated prices, £119 14s. 9d.

Seeing, however, that the prices for the greater part of the work have been previously agreed upon, that for much of the remainder Mr. Manning has precedent to show, and for all, the Council by the Secretary, have agreed to pay, it only remains to do so, and to hope that the new system may prove as advantageous in practice as it is sound in principle. To carry out this principle no time should be lost, and we recommend that the Surveyor be instructed to prepare plans and detailed specifications for the Show-yard works at Bury St. Edmunds, and that the Show-yard Contract Committee be empowered to settle such plans and specifications, and to obtain by advertisement tenders thereupon, to be opened at the Council Meeting in November.

This report was adopted.

The following letter was received from the Privy Council:

"Privy Council Office, Whitehall, Aug. 2, 1865.

"My Lord,—I am directed by the Lord President of the Council to transmit to your Lordship the accompanying copy of an Order which has been issued by a committee of the Lords of the Council, and to request that you will have the goodness to lay it before the Royal Agricultural Society.

"Your Lordship is probably aware that there has lately appeared in some of the dairies in and near London a disease amongst the cattle, closely analogous to, if not the same as, that which has of late years prevailed extensively in Russia, Austria, and the eastern parts of Europe, called the cattle-plague, being a species of typhoid fever. The loss of animals caused by it in those countries has been very serious. Returns have been furnished to this office by which it appears that in 1864, 159,476 cattle were attacked by this disease in Russia,

out of which 104,714 died. The powers vested by law in the Government, with respect to the diseases of cattle, are very limited; and, moreover, it does not appear that in countries where the Governments possess the amplest powers for dealing with cases of this kind, and where they have exercised those powers with great vigour, any signal success has attended their measures. The Lord President therefore thinks that it is upon the care and circumspection of individuals interested in the cattle trade that the chief dependence must be placed for precautions to be taken which may prevent the spreading of this formidable disease. It is of the first importance that all farmers, cowkeepers, or dealers in cattle, when purchasing new stock, should, for several days, not less than 12 or 14, keep their cattle apart from the rest of their stock, until in fact there is reason to think that the new purchases are free from this disease.

"If a farmer, cowkeeper, or salesman should be desirous to get rid of any animals suffering from the disease in question, or even any which may have been in close contact with animals suffering from that disease, it should be impressed upon him, as a public duty, that, at the present juncture, he should not send them to markets, or other places, where they would be brought into contact with other animals; but should cause them to be slaughtered at once; and thus do what he can to prevent the spreading of the disease.

"Particular attention should be paid to the cleansing of all yards, sheds, and other places where cattle are kept; and this cleansing should be especially insisted upon where there has been any manifestation of this disease. These places should be disinfected by the free use of chloride of lime or other allied compounds. It is also of great importance that all diseased animals should be as quickly as possible removed to as great a distance from the healthy as circumstances will allow; and all indirect as well direct communication be strictly prevented between them. The animals which are the most severely affected having at once been killed and buried, their skins may be preserved to the owner by being placed in a disinfecting fluid as soon as removed from the body.

"That it is advisable to kill the diseased animals at once is best shown by the circumstance that it rarely happens that where the disease is allowed to run its natural course, deaths are at a lower rate than 80 per cent., and also by the fact that every diseased animal is a continuous source of danger by disseminating the elements of the infection.

"I subjoin an account of the symptoms, which, according to Professor Simonds, of the Royal Veterinary College, who has paid particular attention, both in this country and in Galicia, to the disease in question, are the usual characteristics of the malady.

"Professor Simonds states that, with the present amount of experience, no special plan of medical treatment can be laid down; but that it would appear that the disease is best combated by a free use of stimulants, conjoined with antiseptic agents, the strength of the animal being kept up by a liberal supply of wheat, or oatmeal gruel, boiled linseed, and similar dietetic agents.—I have the honour to be, my Lord,

"Your Lordship's obedient servant,

"The Lord Tredegar," &c.

"ARTHUR HELPS."

Description of the symptoms of the disease before referred to:—

"Variations in the earliest indications of the disease will be manifested, these depending somewhat on the severity of the attack, but more especially on the circumstance as to whether the digestive or respiratory system is the chief focus of the malady.

"As soon as the affection declares itself, the animal ceases to take any kind of food, and in most cases even refuses water. Rumination is suspended; and the animal stands with its head drooping and the ears drawn back. If made to move, it shows great prostration of strength, and frequently staggers as if about to fall. The skin is hot in places, and often remarkably so between the limbs, the hind ones in particular. An exudation early takes place from these parts, and is succeeded by cracks and sores. The hair is staring, especially along the upper part of the neck, shoulders, and back. The extremities are cold, even at the commencement of the disease—and in a later stage the increased heat of the surface of the body gives place to a remarkable coldness, especially along the course of the spine.

"Tears trickle from the eyes, which are red and expressive



of suffering, and a watery discharge flows early from the nostrils. There is a continuous increase of these secretions, which become more or less purulent in the advanced stage of the malady. The mouth is hot, red, and 'furred,' often presenting here and there raw-looking spots, especially on the inner side of the lips and along the roof. The breath is fetid. The respiration is increased, and generally accompanied with a moan in the advanced stages. A slight cough is also present in some cases. The pulse is quick and weak, and scarcely to be felt, excepting at the heart, even at the commencement of the disease.

"The bowels are sometimes torpid at the outset, but diarrhoea, leading to dysentery, mostly follows, the evacuations being alimy, and of a dirty yellow colour, occasionally tinged with blood. Tenesmus is likewise present as a rule. Slight tremors of the muscles of the shoulders and thighs are to be observed in some cases, and so also in an emphysematous condition of the skin along the upper part of the back. In milch cows the secretion of milk is quickly arrested, a remarkable diminution in the quantity taking place, as one of the early indications of the attack. As the disease advances towards a fatal termination, the prostration of the vital powers becomes more marked, the breathing short, quick, and more painful, the

alvine evacuations fetid and more alimy, and the surface of the body deathly cold. The animal will sometimes sink as early as 12 hours from the commencement of the attack, but in many cases the disease will be protracted to the fifth or sixth, and occasionally to the eighth or ninth day.

"The period of incubation of the disease is found to vary, the majority of the animals sickening on the tenth day after exposure to the infection; but some have been attacked on the seventh day."

This letter having been read, it was moved by Mr. Thompson, and carried, that the thanks of the Council be given to the Lord President, for the communication with which he has favoured them on the subject of the Cattle Plague, and that his lordship be requested to give instructions that any further information that the Government may receive on this subject may be communicated to the Secretary of the Royal Agricultural Society as early as possible, with a view to its immediate publication.

The usual leave of absence was granted to the Secretary, and the Council then adjourned over the autumn recess to Wednesday, the 1st of November.

## THE YORKSHIRE AGRICULTURAL SOCIETY.

### MEETING AT DONCASTER.

Under what may be termed new management, and with a certain additional interest imparted thereby to the proceedings, the great Yorkshire Society paid its visit to Doncaster under very encouraging auspices. The selection of the site was in itself an especial advantage, as there are few towns better calculated to entertain a large gathering, although the inhabitants, with their annual Leger week in the way of a precedent, may be too ready to spring at once to war-prices. However, the neighbourhood, in some return for any such prospective profit, had contributed very liberally to the prize-sheet; and the new Secretary could by no means complain of having his energies crippled from any want of funds. In fact, he was enabled once more to go beyond the customary programme of an agricultural exhibition, and to add on a few classes of fox-hounds to the horse, cattle, sheep, swine, and poultry sections of the Show. Through the repute into which he brought the little Cleveland Society, Mr. Parrington's administrative powers have been well known for some time past, and a glance over the ground at Doncaster assured us that the master-mind was still busy at work on every available improvement. Prominent amongst the additional facilities for the public, rendered so necessary by the increasing popularity of these occasions, was the adoption of the telegram board placed in the centre of the ring where the judges were engaged, and upon which was given the number of the class under inspection, the winning figures being run into the vacant slide beneath, immediately that the award was settled. It is almost impossible to conceive the amount of trouble and annoyance saved by such a plan—one we must say, in justice to ourselves, that we were the first to suggest to the direction of the Royal Agricultural Society some years since, and that now may very probably be brought into use at the national meetings, as Mr. Milward, Mr. Dent, Sir John Johnstone, and Mr. Wilson, all members of council, must have seen how well the system answered at Doncaster. Then the rings were kept scrupulously clear of people who had "no business" there; and, until the rain set-in, a deal of the duty of each day was got through with nice method and commendable despatch. The Tuesday, as heretofore, was devoted to the trials of the implements; but this, at

best, can be considered little more than a bye-day; and, with lowering, threatening weather, very few people were present to watch the several machines put through their paces. These were confined to thrashing machines and grinding mills, both of which did some very good work in competition, the cleaning from chaff and self-delivery into the sack being an especially noticeable feature in the performance of the thrashing machines, and a point for which the Taskers received a medal. The first prize, however, it will be seen, went to the new limited company of Marshall and Sons, with another limited liability concern, now known as Robey and Co., second, and the old house of Ransomes and Sims still standing on its own original foundation, taking all sorts of prizes and commendations for every variety of implement. On the same principle that a new whip was awarded the huntman who had brought hounds the greatest distance to the show, a cup should have been presented to the famous Ipswich firm, though this doubtless found its return in other ways, as the prize-list will prove. There was a long array of stands backed by rows of engines and larger machines on the ground, the Yorkshire and other North Country manufactories being, of course, very strongly represented; and through these the judges carefully proceeded, on the look-out for actual novelty or further improvement, with a view of testifying to this by the allotment of certain miscellaneous moneys at their disposal. But here again the return will be the best commentary, if we merely add on authority that the work made by the grinding-mills sent to trial was very generally good; although, as will be seen from a letter in another column, some of the trials, more particularly of the thrashing machines, were not considered sufficiently searching to be reliable.

Hitherto the judges of cattle, sheep, and pigs have been summoned for the Wednesday, and the heavy and light horsemen for Thursday; but under the new arrangement all these several sets commenced early on the former day, thus leaving the Thursday and Friday open for the parade in the ring, or more systematic inspection in the boxes; a certain seat still being given to the Thursday by the hounds being brought upon the flag, and Blair Athol, the famous Derby and Leger winner, led forth

in all his lonely grandeur at stated intervals. But even hounds and horses are not quite everything to a Yorkshireman, and it is amusing to notice how the public turn and return from one ring to another. At one minute they have the thorough-bred stallions under view; at the next they are criticising the companion-class of coach-horses; and then they are off to see what is doing with the Shorthorns. Somewhat curiously, considering that this is the home of the breed, the Shorthorn cattle, although no other sort is ever exhibited, do not muster in any great numerical force at the All-Yorkshire Meetings, and the best old bull of the Doncaster show came all the way from Scotland. This was Lord Strathallan's Fosco, the second at Newcastle last summer, and who really seems to have gone on improving ever since we last left him. The white is now as level and true as a working bull need be, and in a small and not otherwise strong class he at once placed himself; Lord Pam, the second, though an animal of some repute, being very slack behind his shoulder; and the third but a middling beast in any company. The two-year-olds were, by simply counting them up, in more force; but they were only a rough lot in the bulk, and with not a first-class bull in the entry. Mr. Middleborough's Prince of Wales is certainly a deep, heavily-fleshed animal at his age; but he is pulled down by a bad thin "papery" touch, and he had to yield accordingly to a Bates bull of Mr. Taylor's, with some style about him, as he went round the ring; but that, nevertheless, does not promise to grow up to his present pride of place. In so many words, as with Doctor Fell, we don't like him; while the third prize was almost, if not actually, deformed; and the next, but light, Baron Blencow, fresh or stale from Plymouth, had thus to be content with a commendation. In another very middling field of yearlings, Friar Tuck, looking little the worse for his travels, won as easily as the Scotchman did in the first class; but his brother, Friar Bacon, found some far more formidable opposition amongst the calves, where he was fairly beaten by Mr. Foljambe's Robin, quite a grand young bull, with plenty of length and fashion, a famous touch, and the walk of a race-horse. Of course, the natural question at once arose as to why Robin did not show at the Royal? and to which Mr. Woods straightway replied that Plymouth was too far off to send on young things, or old either; as it is said that a circular is now in the course of signature, the object of which is to prevent the national meetings being ever again held at such inconvenient distances from everywhere. Still, had Friar Bacon been also reserved for the home show, he could have finished no higher than a good second; and the rare quality of Master Hope-well was enough to secure him the third prize, to which the Yorkshire Society is here extending its encouragement. The cows and heifers were altogether better than the male animals, a fact proved by the Doncaster Champion Cup being awarded to Lady Fragrant, to whose extraordinary improvement we spoke when we saw her at Plymouth. Lord Feversham's Princess, again, we reported of as going on famously, while his Lordship matched her here with a deep square heifer, if not quite so elegant, though Captain Oliver divided them with a very pretty little white, rather under-aged for her class, and a curious comparison to Mr. Eastwood's Lady Emily, the best calf at Howden, since when she has grown wonderfully, but lost style in proportion as she increased in breadth and depth. The heifer-calf class here was one of the best of the show, but with Mr. Foljambe again to the fore with a half-sister to Robin, as also by Imperial Windsor, and another, so good and clever all over, that our only regret would be to see stock so full of promise exhibited at so early an age. We have always been inclined to consider these calf classes a mistake, although it is but right to say that breeders seem to take to them very kindly.

Lady Fragrant had not much to best until it came to the cup race, when they pitted Robin against her, and this, despite something to pick from in a very fair class of cows, where Pride of Southwicke was in blooming condition, and indeed has seldom looked better. Then Perfume, so neat and trim and tasty, was all her trainer could make her, and Double Butterfly wearing a deal fresher than when these gay beauties get further a-field. Queen of the May, however, was scratched, from being dead amiss, and so the second prize went to a great fine well-grown cow of Mr. Dugdale's, but bred by Mr. Hales in Kent, and hence her title. Mr. Workman sent a curiosity into this class that looked more like dairy purposes, and that grand old ruin Prince Alfred took the first-class medal in the extra stock, one or two of the judges maintaining that he would have stood well in for the champion cup, had the conditions rendered him qualified to compete. We do hope yet to get a sitting at the Prince, if it be only to show what the sign of "the Bull's Head" should be.

The sheep show, but a short one, depended mainly on the Leicesters, of which the shearing rams were a capital class, and where Mr. Borton again won everything. His first ram was first at Plymouth, and in the old class his first was second at Plymouth and first as a shearling at Newcastle, with second prizes and commendations two or three deep, still speaking to the increasing excellence of the Barton flock, which now wins as easily abroad as it does continually about home. Mr. Marshall also repeated his West Country triumphs with his Improved Lincolns, but not without some creditable competition; and Lord Wenlock had it all his own way with the short-wools, a kind of Shropshire-Southdown, and a useful sheep no doubt, but not very imposing in appearance, which did not seem to tell much with Messrs. Druce and Purves; though it is right to add that Mr. Simpson's four-shear down ram, pronounced to be a very good sheep, and which took the first-class silver medal in extra stock, was also bred by Lord Wenlock.

It is questionable whether a big pig is ever quite appreciated out of Yorkshire, where Mr. Wainman, Mr. Dyson, Mr. Dickin and others gain great fame, and "some reward beside," by their monster whites. Some of the large sows were very good, and not so coarse as they commonly run; but the two best classes of swine were the small boars and small sows. The judges gave a general commendation to the latter, and the first prize boar was the best pig in the yard. He is good all through with capital shoulders and fore-quarters, a rare back, and, moreover, a nice coat, or in fact, with some covering in the way of hair on him. We were pleased, indeed, to see that the judges, as in the case of Lord Wenlock's young sow and other prize-takers, clearly made this question of coat a leading point; for nothing looks worse, or wears worse than a bare pig, though to nothing are we more certainly coming. It is an abuse that the awards can perhaps alone correct, and it is, we repeat, satisfactory to record that the decisions at Doncaster should go to check so growing an evil. The second-best small boar, a famous one to meet, and rather better than Mr. Mangles' about the head, was first the other day at Plymouth, and the Givendale pig a Royal first at Newcastle, whence he takes his title, for names are given to pigs in Yorkshire almost as religiously as they are to horses or children. The pigs of any breed not qualified to compete as large or small seem to depend mainly on the bigger sorts for their excellence, such as it is; and of the pigs for use, that is stores, Sir George Wombwell and Mr. Walton sent two famous pens, which finished first and second, with due discrimination evinced over their relative merits, Sir George's being particularly good about their necks and shoulders. Of course the colour

ran all through upon white, and an Essex or Berkshire breeder would look in vain for anything of a darker hue, Mr. Hutton's big prize sow being, we believe, the only entry on the ground with even a stain on her skin.

Compared with Plymouth, the horse show at Doncaster was a great success; and a wonderful thing if it had not been, when we take into consideration that in one place they think and talk of nothing but Leger winners, fair-days, and good steppers, and in the other of squadrons, salutes, regattas, oars, and boats. The arrangements and conduct of the horse show under the experienced direction of the new secretary were almost perfect, and we have no doubt that everything would have worked well on the Thursday if it had not been for the torrents of rain, which put a damper upon everything. The horse ring itself was first-rate. During the judging it was divided by a centre rail, forming companion rings for two sets of judges; but this demarcation line was afterwards removed, thus making a grand circle for the promenading of the different classes. If there was one thing wanting, it was a little more pasteboard—a point we have insisted on over and over again; that is, the horses should be numbered on both sides the head—not with flying strips, but thick pasteboard, or rather painted leather—a number *for the judges* by all means, and also one *for the public* a customer that the real itinerant showman or accomplished Barnum never forgets, as upon such depends the continued success of these meetings. We allude more especially to the business of the first day, at half-a-crown a head, when, through this slight omission, the catalogue was next to useless, without a man had the legs of Spring-heeled Jack, or the perseverance of a Drinkwater, to dodge the horses round and round the ring. The boxes and sheds were a great improvement on Howden; but, if anything, some of the horses were a little too much boxed up; for if a groom liked to turn the key, and wend his way with some insidious treating-friend to the refreshment booth, and there, o'er a glass of Hodges, Bass, or Burton, dilate upon the wonderful points or splendid action of the animal he was in charge of, the interested and paying public might wait and whistle in vain for a view. This in future may be prevented by having shifting sides, open in the day and closed at night, as already adopted at the Royal meetings. Of thorough-breds there was a large display; and one of the great attractions of the show, if not the greatest, if we may judge by the eagerness with which the crowd rushed to the ring on his parading it twice a day, was Blair Athol, the Olympian hero of '64, who was kindly sent by his owner to be exhibited, but not to contend for a prize. Everybody's mouth, both lads' and lasses', was full of the praises of Blair Athol, as well as "Butter Scotch," a sweetmeat in great vogue in the town of Doncaster, and, as we are told, throughout Yorkshire. We must say that we delight in seeing a brawny, middle-aged man with his mouth crammed full of lollipops, as it shows that he has still sweet reminiscences of the little kindnesses of his poor dear mother. A great many, though, seemed to prefer "ginger." We can join in the praises of Blair Athol without the Butter Scotch, for he has much thickened since put to the stud, while he danced round the ring with his springy action as if hung upon wires. Many of his foud admirers made him out the winner of great races he never started for, and as having beaten horses he never met.

Now to go along with the judges, who commenced their labours between eight and nine, beginning at the beginning this time with the thorough-bred stallions for getting hunters, instead of keeping them to the last, as they were wont to do. The two prizes of £25 and £10 brought together no less than seventeen; the first on the list being Antwerp, the second-prize horse at Howden

last year, and of whom we thus wrote:—"Antwerp is a dark brown, about fifteen-three, with a good head, fine, strong, well-made neck, running into a beautifully well-laid shoulder, capital round barrel, first-rate back and loins, with good quarters, thighs, arms, and wiry short legs. He is a picture of strength and hardiness, being muscular and vigorous as a gladiator, but, withal, the gentleman. It is seldom we have seen a country stallion that we have liked better, and must own that after our eyes had once rested on him they would not take to any of the others." The next was King Brian, a useful country stallion, and a horse of great substance, with a good sensible head, a long neck, capital top, and big short limbs; while he is a fair mover, but so frightful a disher that his highness when trotting would scarcely get along some of our old lanes and bye-ways without brushing the banks. Then came the sweet-headed, blood-looking, clean-limbed Skirmisher, beautiful to look at, but a little light in the middle; and the very neat and showy deep-topped, short-legged Drumour, against whom, barring a little heaviness at the point of his shoulder, there was not much to say, combining as he does strength with light free action and fine quality. The fifth was Cawston, a nice-looking, compact, big-framed, and big-limbed horse, as a hunter all over; but in his action he drew his hind legs after him in a wide straggling manner, as if they were of very little use, and in a way that was anything but pleasing to the eye. After him, the weedy Pax, the vulgar wooden-looking Llanwrst, the renowned game old Yorkshire Gray, who looked more of the neat hack or hunter for a light-weight than a sire, and the short-necked, goodish-middled, leggy Rivet, that we did not fancy. Then, there was Richmond, a very useful horse, long, low, and muscular, with capital ends and limbs; but Engineer we consider a brute, and The Swell a misnomer, who surely ought to have been called The Snob, for a more vulgar, half-bred-looking dandy in the shape of a thorough-bred we have seldom seen. With old Sharston time had worked wonders, and left behind but a faint memento of the past, though Aribbas was all over a neat one, and for symmetry, action, and the way he carried himself, take him all in all, one that few on the ground could beat. Croton Oil at twenty-four years of age is still a game-looking old horse of great character, with a long light middle, good ends and limbs; and last, though not least, came St. Clare, a horse that we look upon as a curiosity, for his head is wrong, his neck heavy, and his shoulders go too far into it. He has certainly hunting withers; but withers alone will not make a hunter. His back is slack and hollow, and he is leggy though big in the limb. We were going to say he looks like a coach-horse, but we hardly know what he looks like; certainly not a thorough-bred sire or a hunter. And if, as we said last year, "he is not to be found in the Stud-Book, his owner might as well have entered a Clydesdale," as he cannot comply with these conditions, and the prizes must be withheld. The first of these went to Cawston, the second to St. Clare; and if ever any Judges went for quantity instead of quality, they did at Doncaster on Wednesday last, when they awarded that second premium in the way they did. The reserved horse was King Brian. For the £50 for thoroughbred stallions, to serve mares in the neighbourhood of Doncaster, Antwerp, Pax, Llanwrst, Aribbas, Engineer, The Swell, Sharston, Poynton, and St. Clare again entered the circle, the prize going of course to St. Clare. The hunters showed a falling off, after the Howden Show of last year, as rather weak for Yorkshire, for one looked in vain for such horses as Melton, Sprig of Nobility, Highwayman, and Sir Robert Peel. The hunting brood-mares were good, Mr. Tindall winning with a level, deep-ribbed, powerful mare,

with fine big limbs, but an upright shoulder. The second, Miss Nightingale, was a varmint old mare, of an out-and-out good stamp; a rare shape, without lumber, and that looked going in her time with any hounds. Old Marigold, the dam of Melton and Sprig of Nobility, showing better than ever, with a foal by her side, and the winner of a host of prizes, was in the ring, as also Maid of the Meadow, a powerful one, but lacking quality, of Mr. Everett Jackson's; while Mr. Mellows, Mr. Hodgkinson, and Mr. Snowden showed a fair style of mare, and Mr. Oliphant a relict of the past—the remains of a good sort. The two year-old hunting geldings were not first-rate, Mr. Boynton's chestnut being neat, but with not the best of shoulders; and Mr. Shepperd's bay being long, low and hardy-looking. Mr. Leaf had a chestnut of some character forward, but there was a lamentable falling-off behind. The two-year-old fillies were no great improvement on the geldings; Mr. Wightman's first being a filly of great power, lengthy, with short, big limbs; and Mr. St. John L. Clowes, by Aribbas, very neat, but light of bone. Mr. Tetlow had a long, big-boned filly; but Mr. Vickers's "Miss Smith" was anything but a hunter to look at. Of the three-year-olds, with fourteen entries, eight only were shown, Mr. Clark's Patient, an old-fashioned colt, no beauty, with a bad eye, but a good mover, being placed first, and a rather good-looking brown of Mr. Meiklewaite's second; whilst Mr. Booth's Buffoon, one of the nicest-formed horses we have seen for a long time in the shape of a hunter, as on whom, at the outside of the ring, they were betting two to one, was nowhere! and Mr. Bean, of York, had also a nice, showy, corky bay in this class. The three-year-old fillies were good, Alice by Lord Fauconberg being very powerful and compact; Mr. Sykes' Gem good-shaped and wiry; and Mr. Bently showed a good stamp by Glancus. With an entry of nineteen, and nine only shown, Mr. Jackson Everat was first with Memnon, a clever, compact horse, with rather small joints; the second, Mr. Percy's Ingleby, the prize horse at Islington, who was also second to Memnon last week at Rasen, being a good-looking, stout horse, with fine limbs, but a little too much flourish in his paces for a hunter. Mr. Clark's Cotton Stockings is a horse of some character, but he went very short; and Mr. Lister's Woolwich, a lengthy grand-looking horse of some quality, that would not be out of his place as a hunter, a charger, or in the park. Mr. Marley's Blondin was a short, two-ended horse; Mr. Swinbick's Gil Blas, a light blood-like hunter, and Mr. Batty's also of a fair stamp. The first and second four-year-old hunting fillies were two neat ones in a very small class. The five-year-olds, possessing not less than three crosses of blood, with ten in the ring, went to Mr. Darley's Camillus, a good topped horse, with a beautiful blood-like head and neck, but light of bone below the knee; while the second prize, Springwater, was also a very neat mare, with rather a long waspy middle. Mr. Maynard's Shrubland was a nice showy horse, with light head and neck, and Mr. Pease's Silas Marner looked as stout, compact, and short on the leg as ever. Mr. S. Levison Lane's Sportsman was a rare good sort, up to weight, long, deep, powerful, and short on the leg, as a prize horse at Stockton, Middlesboro, and Ripon; and Mr. Booth had a fine mare in Ballet Girl, but with barely the three crosses in her appearance. The six-year-old geldings or mares were a poor class, and but few anything like hunters. The first, Peter, is a slashing blood-like horse, but in his paces he went round and high, more, in fact, as a charger, whilst Conjuror was all over a hunter, as moreover he went like one. Mr. Barton's Viscount was useful-looking forward, but fell off behind; and Mr. Barker's Sultanness had the winner's falling, and

looked and went more like a light charger. Mr. Smith's Patch was a stout, but apparently not much of a mover; Mr. Greetham's King Dan not a bad sort, and Mr. Bentley's Corringham up to weight at a certain pace.

The roadsters were not in great force, nor was there anything very grand about them for Yorkshire. The first prize stallion, Pride of the Isles, was a small kind of Norfolk trotter, with a round heavyish shoulder and head very badly set on; the second Merrylegs, a compact big-limbed horse with a vulgar head, but a good mover. Mr. Warburton's Pride of Engand was very handsome, and Mr. Read's Qui Vive, a useful sort for a Brougham or heavy dog-cart; while Mr. Laycock's Young Merrylegs looked dull in his coat, and leggy, and light in his middle, but he moved well. The roadster brood-mares were but three, Bonny being a stout, short, rather vulgar mare, and Gipsy of a good stamp, long and low, with lots of character; but the other, Mr. Hawley's Nancy, was just a clever little hack. The three-year-old roadster geldings or fillies were a poor lot, the first, Mr. Lofthouse's, being just a common old-fashioned sort that one generally sees now-a-days with a butcher up, shouldering his tray. The second, the property of Mr. Norton, had a good frame, limbs, and action; and Mr. Clowes, whose runner knew how to show a horse, had a clever lengthy filly that was also a good goer. Of the hackney mares and geldings we did not see much, having only just time to note two or three old friends, namely, Crafty, who took the first prize, Mr. Pease's Whitefoot, and a nice old flea-bitten cob of Mr. Richardson's, when a thunderstorm broke over-head, down came the rain in earnest, and away went the judges and the court helter-skelter, as if old Judge Jefferies himself had risen up amongst them, and was going to hang the lot. The gentlemen's cobs were anything but a gentlemanly lot, the only gentleman among them being Rory O'More, a cream-coloured Irish horse, the property of Mr. Hadsock. The first prize, Robin, was a strong, useful cob, with not the best hind-leg action, nor remarkable for very good looks, whilst the second was a stong, useful on wooden legs, and woe to the gentleman of sixteen stones that trusts so much real property on so an unwieldy a heap! while Mr. Norton's Tom Sayers was a long, vulgar cob, with action rough enough to shake all the shape out of any sixteen-stone citizen in the kingdom. There were one or two nice hacks shown as ladies' horses—the first, Dandy, being a neat corky galloway, very fair in his paces; and the second, Mr. Clowes' brown mare, about as neat a hack, with plenty of blood, as one would wish to see. Mr. Bentley's bay looked and went like a lady's horse; and Mr. Benson's Betty, though not a beauty, was about the best goer, bringing her hind legs well under in her canter. Amongst the ponies over twelve hands there were some very nice ones, but nothing to startle the eye like King Pippin at Howden last year. Victoria, the first pony, is of a rare shape, with power, and Mr. Milward's Rachel, the second prize, also a very nice one. Amongst the others that struck us were Sir W. R. C. Cooke's Second to None, Mr. Linley's Willie, Mr. Hodgkinson's remarkably gay, showy little fellow Rapid Rhone, Mr. Mapplebeck's Charlie, Mr. Bentley's Gray Charlie, Mr. B. Johnson's Cariboo, and Mr. Ireland's Jerry. There were some nice ponies also under twelve hands, and among them Mr. Dugdale's General Tom Thumb, Mr. Richardson's Uncle Tom, the first prize, Mr. Barker's Roland, Mr. Haggis' Billy Minute, and Mr. Bentley's Brown Charlie. The second prize went rather to the beseeching looks of an indefatigable little lad in boots, than to the rat of a pony he was riding about all the day; and from this we draw this conclusion, that if a young lady had been up in the palfrey class, and had cast such beseeching looks on Mr. Bennett or Mr. Hobson as this lad did,

when they were looking out for a second for the pink ribbon, or tipped one a winning smile and the other a disavow, no matter whether she had been on a brown all legs and wings, a wooden-going grey, or a model Suffolk Punch, we feel quite satisfied she would have carried off the colours. As a nod is as good as a wink, we shall expect to see some ladies up by next year.

The coachers were very well represented throughout, if not in numbers so much as in quality. The first-prize stallion, Prince Arthur, is a very grand-looking horse, a dark bay Cleveland, though perhaps not so good a mover as some of the others, and he was the first-prize at Howden last year also. The second, Candidate, was a strong well-built horse, with big limbs, and a good stepper; while Mr. Haig's Brown Harkaway had good action, as had Mr. Dawson's Scriveton. Amongst the others that caught our eye were Mr. Denby's Rawcliffe and Liverpool, and Mr. Benton's Nobleman. The brood mares with foals were a capital class, old Venus, who has taken the prize four years in succession, being again the winner. We have often described her in these columns, and she only wants seeing to be appreciated. The second, Lady Manor, was another great prize-taker, and of a first-rate stamp, as were Mr. Coulson's Bess and Mr. Benton's Polly Hopkins. In the two-year-old class the second prize struck us as being a little coarse, and the first as rather a nice colt; and in the fillies, with only two entries and a prize for each, they were of about the same calibre, the best being a very neat one, and the second more common-looking. The three-year-old geldings' prize was taken by a good one of Mr. Johnson's, that has won already at Scarborough and Driffield; but the second was rather leggy. The three-year-old fillies were a nice lot, and went as they stood in the catalogue, the third and unrewarded one being Mr. Robinson's Rudby Lass.

The agricultural horses were in strong force, but the principal competitors in many classes were old stagers, and as well known in the agricultural world as Professor Simonds, Alderman Mechi, or Mr. Fisher Hobbs, and had met one another almost as often. For instance, there were Lincolnshire, the Newcastle horse Champion, a Clydesdale famous in Yorkshire and Dublin, and Young John Bull, the Worcestershire prize horse, all now in competition. Lincolnshire beat Champion at Howden last year; but Champion had beaten Lincolnshire previously, and now beats him again at Doncaster. Champion is a beautiful specimen of the Clydesdale, as active as a kitten, and as good-looking as he could be. Indeed, it was a treat to see him move, when bearing in mind the tons of flesh one has to meet with in the shape of cart stallions, going along as if they were a burden to themselves. The Worcestershire horse, a fine specimen of the dray-horse, beat the Newcastle winner for the second place; while Champion also put in a bid for the £50 for serving mares in the neighbourhood of Doncaster, and, with nearly the same competitors, of course was awarded it. There were many fine specimens of the cart stallion, but, rain coming on, they were ordered in almost as soon as they were out on the second day for parade. For brood mares with foals suckling, Mr. Tennant's well-known sturdy blacks, Trip and Jet, put all other competitors in the back-ground; and another of Mr. Tennant's, a very useful grey, was first in the three-year-old class; as was Mr. Norton in the four-year-old, without opposition, with Conqueror, a neat, light, active cart-horse. The catalogue was strong in entries of agricultural horses, but many of the classes did not turn out half the numbers put down; and the pride of this section centred on the stallions, over which the judges dallied for between two and three hours before they ever came to a decision.

Tuesday, as we have said, was dull and threatening,

while Wednesday, with showery weather during the morning, broke out into a thunder-storm about four, and rapidly cleared the ground; and on Thursday more heavy rain fell about mid-day, to the total discomfiture of the fox-hound judges, who had to get through their remainder as best they could. Lord Wemyss once more carried off the chief prizes, as he was wont to do in the Cleveland country, though the competition was not up to what we have seen in the North Riding, and huntmen would appear to require a deal of enticement, in the way of supplementary premiums for themselves, to induce them to enter. But there is no prettier sight, on a fine day, than a house show, with the men grouped about in their scarlet coats, whereas the elements went all against this at Doncaster, about the only thing that the management had not properly provided for. Let us, still, always except an official prize list, which a society of such calibre should certainly give, as it is unfair alike to the exhibitors and the public not to do; but this is an old and now almost a solitary grievance. There was a dinner, at which the retiring president the Duke of Devonshire took the chair, to be succeeded in turn by the Honourable Admiral Dundee in 1866, when the meeting will be at York, where as a rule it should be held every third or fourth year.

## PRIZE LIST.

### CATTLE. SHORTHORNS.

JUDGES.—W. Bartholomew, Waddington Heath, Lincoln.  
J. Douglas, Athelstaneford, Drem, N.B.  
G. Drury, Holker Hall, Newton-in-Cartmel.

Bulls above three and not exceeding six years old.—First prize, £20, Viscount Strathallan, Strathallan Castle, Auchtermarder, Scotland (Fosco). Second of £10, R. J. Middleborough, South Milford (Lord Pam). Third of £5, J. Dickinson, Partridge Hill, Bawtry (Royal Oak). *Commended*: P. Brown, Glentworth, Lincoln (Maestman).

Bulls above two and not exceeding three years old.—First prize, £20, J. Taylor, Moreton Whalley, Lancashire (Shannon). Second of £10, J. B. Middleborough (Prince of Wales). Third of £5, W. White, Burrill, Bedale (Prince Arthur). *Highly Commended*: J. Charlesworth, Headfield, Dewsbury (Baron Blencow). *Commended*: T. Dawson, Poundsworth, Driffield (Next of Kin), and E. Hodgkinson, Morton Grange, Bedford (Highland Duke).

Bulls above one and not exceeding two years old.—First prize, £20, F. H. Fawkes, Farnley Hall, Otley (Frier Tick). Second of £10, S. Wiley, Brandebury, York (Earl of Derby). Third of £5, J. Peacock, North Holme, York (Veteran). *Commended*: Rev. J. D. Jefferson, Thicket Priory, York (Duke of Waterloo).

Bull Calves above five and not exceeding twelve months old.—First prize, £10, G. S. Foljambe, Osberton Hall, Worksop (Robin). Second of £5, F. H. Fawkes, Farnley Hall, Otley (Frier Bacon). Third of £2, T. C. Booth, Warley, Northallerton (Master Hopewell).

Cows of any age above three years, in-calf or milk.—First prize, £20, Lord Feversham, Duncombe Park, Helmsley (Pride of Southwicks). Second of £10, A. Dugdale, Rye Hill, Burnley (Kent Cherry). Third of £5, Lady Pigot, Branches Park, Newmarket (Perfume). *Highly Commended*: J. R. Middleborough (Gay Lady). *Commended*: B. Eastwood, Thorney Holme, Clitheroe (Double Butterfly), and J. Taylor (Eugenie).

Heifers not exceeding three years old, in calf or milk.—First prize, £15, T. O. Booth, Warley (Lady Fragrant). Second of £5, Lady Pigot (Lady of Rosalia).

Heifers not exceeding two years old.—First prize, £15, Lord Feversham (Princess). Second of £5, R. E. Oliver, Sholebrooke Lodge, Towstester (Campanella). *Highly Commended*: Lord Feversham (Violet). *Commended*: B. Eastwood (Lady Emily).

Heifer Calves above five and not exceeding twelve months old.—First prize, £10, G. S. Foljambe, Osberton Hall, Worksop (Rose of Windsor). Second of £5, Messrs. Dudding, Pantom House, Wragby (Pride of Pantom). *Highly Commended*: B. Eastwood (My Mary). *Commended*: Lady Pigot (Victoria Rubicunda), and B. E. Oliver (Chrysalina).

The Champion Cup, value £35, for the best animal in any of these classes, to T. C. Booth, Warley (Lady Fragrant).

### CATTLE OF ANY BREED.

Cows for dairy purposes.—First prize, £7, Lord Lonsborough, Grimsdon Park, Tadcaster. Second of £4, B.

Hodgkinson, Morton Grange, Retford (Ruth). *Commended*: W. Jenkinson, Cadeby, Doncaster.

#### EXTRA STOCK.

First-class Silver Medal, T. C. Booth, Warlaby (Shorthorn bull, Prince Alfred). Second-class Medal, G. S. Foljambe (fat steer).

#### SHEEP.

##### LONG WOOLS.

Judges.—J. Buckley, Normanton Hill, Loughborough. H. Mackinder, Langton Grange, Spilaby.

##### LEICESTERS.

Shearling Rams.—First prize, £15, J. Borton, Barton House, Malton. Second of £5, J. Borton. *Commended*: J. Borton, for three other rams.

Rams of any age.—First prize, £10, J. Borton. Second of £5, J. Borton. *Commended*: T. Marria, The Chase, Ulsby.

Pens of Five Ewes.—First prize, £10, W. Angus, Newark, Driffield. Second of £5, J. Simpson, Spofforth Park, Wetherby.

Pens of five Shearling Gimmers.—First prize, £10, J. Borton. Second of £5, J. and E. Tindall, Knapton Hall, Billington. *Commended*: W. Brown, Highgate, Holme, on Spalding Moor, and R. Lovel, Knapton, Billington.

#### LINCOLN AND OTHER LONG WOOLS.

(Not qualified to compete in Leicesters.)

Shearling Rams.—First prize, £15, T. B. Marshall, Branton, Lincoln. Second of £5, T. B. Marshall. *Commended*: E. J. Howard, Rise Farm, Nookton, Lincoln.

Pens of five Ewes.—First prize, £10, R. C. Workman, Almholme, Doncaster. Second of £5, W. Mallowa, High Malton, Doncaster.

Pens of five Shearling Gimmers.—First prize, £10, R. C. Workman. Second of £5, T. B. Marshall.

##### SHORT WOOLS.

Judges.—J. Druce, Eynaham, Oxford.

P. Purves, Alconbury, Huntingdon.

Shearling Rams.—First prize, £15, Lord Wenlock, Esrick, York. Second of £5, Lord Wenlock. *Commended*: T. Marria.

Pens of five Ewes.—First prize, £5, Lord Wenlock, Esrick, York. *Commended*: Lord Wenlock.

Pens of five Shearling Gimmers.—First prize withheld. Second of £5, J. Brown, Rossington, Bawtry.

#### EXTRA STOCK.

First-class Silver Medal, Joseph Simpson, Spofforth Park, Wetherby (for four-shear down ram). Second-class Silver Medal, W. Brown, Highgate (fat Leicester three-shear ewe).

#### PIGS.

Judges.—J. Druce, Eynaham, Oxford.

P. Purves, Alconbury, Huntingdon.

J. Buckley, Normanton Hill, Loughborough. H. Mackinder, Langton Grange, Spilaby.

Bears of a large breed.—First prize, £5, W. B. Wainman, Carhead, Crosshills, Leeds. Second of £3, R. Dickinson, Old Road, Stockport. *Highly Commended*: J. Dyson, Dock-street, Leeds.

Sows of a large breed, in pig or milk.—First prize, £5, J. Dyson, Leeds. Second of £2, R. Duckering, Northorpe, Kirtun-in-Lindsey. *Highly Commended*: S. S. Jackson, Nelson-street, Halifax. *Commended*: C. W. Graham, York-road, Leeds.

Bears of a small breed.—First prize, £5, G. Mangies, Givendale, Ripon. Second of £3, R. Dickinson. *Highly Commended*: J. Brown, Rossington, Bawtry, and Wm. Parker, Golden Lion Inn, Bradford.

Sows of a small breed, in pig or milk.—First prize, £5, Lord Wenlock, Esrick Park, York. Second of £3, M. Walton, Foundry-street, Halifax. *Highly Commended*: B. Calvert, Myrtle-place, Bingley. The class *Commended*.

Bears of any breed, not qualified to compete as large or small. First prize, £5, R. E. Duckering. Second of £3, C. W. Graham.

Sows of any breed, in pig or milk, not qualified to compete as large or small.—First prize, £5, M. Walton, Foundry-street, Halifax. Second of £3, J. Norton, Nortonthorpe Hall, Huddersfield.

Three Store Pigs of any breed and of the same litter, from four to nine months old.—First prize, £5, Sir G. O. Wombwell, Bart., Newburgh Park. Second of £3, M. Walton.

#### Pigs not Exceeding Twelve Months Old.

Bears of a large breed.—First prize, £3, J. Dyson, Adelphi Hotel, Leeds.

Sows of a large breed.—First prize, £3, R. E. Duckering.

Bears of a small breed.—First prize, £3, Wm. Parker. *Commended*: C. W. Graham.

Sows of a small breed.—First prize, £3, Lord Wenlock.

#### EXTRA STOCK.

First-class Silver Medal, S. Wiley, Brandaby (litter of pure small bred pigs, ten weeks old). Second-class Silver Medal, M. Walton, Halifax (gilts, seven months, middle breed).

## HORSES.

### HUNTERS AND ROADSTERS.

Judges.—J. E. Bennett, Bosworth Grange, Rugby.

G. A. Grey, Milfield, Wooler.

W. E. Hobson, Kettlebythorpe, Brigg.

### COACHING AND AGRICULTURAL HORSES.

Judges.—W. Robinson, Hutton Hall, Orvington, Darlington.

B. Wilson, Brawth, Thirsk.

C. Wood, South Dalton, Beverley.

Thorough-bred Stallions for getting Hunters.—First prize, £25, J. Peacock, North Holme, Oswaldkirk, York (Cawston). Second of £10, J. Smith, Hut Green, Pontefract (St. Clare).

Thorough-bred Stallions, not less than four years old, for getting weight-carrying hunters, to serve mares within a radius of 15 miles round Doncaster staying one whole day in each week in the town during the season 1886, at a charge not exceeding 4 guineas each mare, including the groom's fee.—Prize of £50, J. Smith, Hut Green (St. Clare).

Stallions for getting Coach-horses.—First prize, £20, J. Johnson, Brigham, Driffield (Prince Arthur). Second of £5, R. Gill, Kelfield, York (Candidate). *Commended*: Robt. Gill (Governor).

Stallions for getting Roadsters.—First prize, £10, W. H. Brown, Beltoft, Bawtry (Blaseway). Second of £5, B. Balderstone, Mount Pleasant, Boston (Merrylegs).

Stallions for getting Agricultural Horses.—First prize, £20, Wm. Simpkin, jun., Burton Agnes, Louthorpe, Hull (Champion). Second of £10, T. Johnson, Hatfield, Doncaster (Young John Bull). *Commended*: S. Strickland, Headley Hall, Tadcaster (Lincolnshire).

Stallions, not less than four years old, for getting agricultural horses, and to serve mares within a radius of 15 miles round Doncaster (staying one whole day in each week in the town) during the season 1886, at a charge not exceeding 3 guineas each mare, including the groom's fee.—The prize of £50, W. Simpkin, jun. (Champion). *Highly commended*: T. Johnson (Young John Bull). *Commended*: S. Strickland (Lincolnshire).

Brood Mares for breeding Hunters, with Foals sucking.—First prize, £10, Wm. Tindall, Wheatley, Doncaster (Fanny). Second of £5, A. Macbean, The Hall, Thirsk (Miss Nightingale).

Brood Mares for breeding Coach-horses, with Foal sucking. First prize, £10, W. and F. Coulson, Gaterley Farm, Castle Howard (Venus). Second of £5, Wm. Harrison, Hutton Rudby, Yarm (Lady of the Manor).

Brood Mares for breeding Roadsters, with Foal sucking.—First prize, £7, Wm. Charlesworth, Netherton, Wakefield (Bonny). Second of £3, G. Machin, Hatfield, Doncaster (Gipsy).

Brood Mares for breeding Agricultural Horses, with Foal sucking.—First prize, £10, Wm. Tenant, Barlow, Selby (Trip). Second of £5, Wm. Tenant (Jet).

Two-year-old Hunting Geldings.—First prize, £7, T. Dawson, Poundworth, Driffield (Boynton). Second of £3, J. Shepherd, Beechgrove House, Tadcaster.

Two-year-old Hunting Fillies.—First prize, £5, J. D. Wightman, Sutton House, Malton. Second of £3, St. J. L. Clowes, Tortworth, Bawtry.

Two-year-old Coaching Geldings.—First prize, £7, R. J. Bentley, Finningley Park, Bawtry. Second of £3, S. Waterhouse, High Eilers, Doncaster.

Two-year-old Coaching Fillies.—First prize, £5, J. Jackson, jun., Great Ayton, Stokesley (Cliff Laas). Second of £3, John Waller, High Leven, Yarm.

Two-year-old Agricultural Geldings or Fillies.—First prize, £7, E. Hodgkinson, Morton Grange (Heart of Oak). Second of £3, T. Turner, Armthorpe, Doncaster.

Three-year-old Hunting Geldings.—First prize, £10, W. H. Clark, Hook, Howden (Patient). Second of £5, R. Micklethwaite, Ardsley House, Barnsley (Darfield).

Three-year-old Hunting Fillies.—First prize, £7, T. B. Ireland, Tadcaster (Alice). Second, R. Sykes, Drighlington, Leeds (Gem).

Three-year-old Coaching Geldings.—First prize, £10, J. Johnson, Brigham. Second of £5, J. S. Darrell, West Ayton, Scarborough (The Ebor).

Three-year-old Coaching Fillies.—First prize, £7, O. Wood, Sparrow Hall, Salton, York (Darby). Second of £3, Messrs. W. and F. Coulson, Gaterley Farm, Castle Howard, York (Violet).

Three-years old roadsters, geldings, or fillies.—First prize, £7, Christopher Lofthouse, Tadcaster. Second of £3, J. Norton, Nortonthorpe Hall, Huddersfield (Lord Fauconberg).

Three-years old agricultural geldings or fillies.—First prize, £10, Wm. Tennant, Barlow, Selby (Tom). Second of £5, C. Oxley, Hambleton, Selby (Punch).

Four-years old agricultural geldings or fillies.—First prize, £10, J. Norton, Nortonthorpe, Huddersfield (Conqueror). *No other entry*.

Four-years old hunting geldings.—First prize, £15, Jackson Everatt, Park-lane, Doncaster (Memnon). Second of £3, H. J. Percy, Howsenrigg, Aspatra, Cumberland (Ingleby).

**Highly commended:** R. C. Lister, Unseeloot Grange, Goolo (Woolwich).

Four-years old hunting fillies.—First prize, £10, M. Kidd, Tadcaster. Second of £5, Wm. Tindall, Wheatley, Doncaster (Regalia).

Five-year-old hunters, geldings, or mares, warranted sound, and to possess not less than three crosses of blood.—First prize, £20, Henry Darley, Aldby Park, York (Camillus). Second of £5, J. Rolson, Windlebeck, Ganton, York (Spring Water).

Hunters, geldings, or mares, six-years old and upwards.—First prize, £20, A. Barker, Hatfield, Doncaster (Peter). Second of £5, Sir J. V. B. Johnstone, Bart., M.P., Hackness, Scarborough (Conjuror).

Hackneys, mares, or geldings, four-years old and upwards, qualified to carry 12 stones, and not less than 14 hands high.—First prize, £20, H. J. Percy, Howsenrigg (Crafty). Second of £5, G. Wakefield, Nessingham, Kirton-in-Lindsey (Pride of the Isle).

Gentlemen's cobs, any age or sex, qualified to carry 16 stones.—First prize, £10, H. J. Percy, Howsenrigg (Robin). Second of £5, B. Milward, Conisburo, Rotherham (Selim).

Ladies' hackneys, of any age or sex.—First prize, £10, W. H. Gaunt, Old Thornville, York (Dandy). Second of £5, St. John L. Clowes, Torworth, Bawtry.

Ponies, from 12 to 14 hands high, any age or sex.—First prize, £10, J. W. Pease, Woodlands, Darlington (Victoria). Second of £5, R. Milward, Thurgarton Priory, Southwell, Notts (Rachel).

Best ponies, under 12 hands high, any age or sex.—First prize, £10, J. W. Richardson, Willoughton, Kirton-in-Lindsey (Uncle Tom). Second of £5, J. W. Turner, Sickling Hall, Wetherby (Bullet).

#### EXTRA STOCK.

First-class silver medal, A. Hind, Crowle, Bawtry (cart horse), J. Jackson, Doncaster (Depper).

#### DAIRY PRODUCE.

Cheese, not less than 1 cwt. in quantity, made since October 1st, 1864, the produce of one dairy.—First prize, £3, E. Temple, Saltergill Farm, Yarm. *No other entry.*

Firkins of butter.—First prize, £5; second, £2. *No entry.*

Six pounds of fresh butter, in single pounds.—First prize, £5, B. C. Workman, Almholme, Doncaster. Second of £2, Thos. Waite, Chequer House, Doncaster. Third of £1, B. Thompson, Poulds, Tickhill, Rotherham.

#### WOOL.

Judges.—T. Clayton, Stainley Hall, Ripon.

Five hogg fleeces, long-wool.—Prize, £5, B. C. Workman, Almholme.

Five hogg fleeces, short-wool.—Prize, £5, B. H. Brooksbank, Tickhill, Rotherham.

#### FLAX.

Judges.—R. Briggs, Leeds.

H. Ludolf, Leeds.

Specimens of mill-scuted flax. *No entry.*

Specimens of dew and cold water retted hand-scuted flax, not less than 20 stones, retted and scuted by the exhibitor.—First prize, £10, F. Moody, East Butterwick, Bawtry. Second of £5, J. Beachell, Rawcliffe Grange, Selby.

Specimens of green flax, growth of 1865, not less than 20 stones, grown by the exhibitor.—First prize, £10, J. Laversack, Keadby, Bawtry. Second of £5, J. Lofthouse, Borough-bridge.

#### IMPLEMENTS.

Judges.—T. Martin, Wainfoot, Lincoln.

W. Owen, Engineer, Rotherham.

T. Scott, Broom Close, Ripon.

J. Wilson, Manor House, Morpeth.

Thrashing Machines, driven by steam power, subject to thorough trials in thrashing grain and delivering it into sacks ready for market.—First prize, £50, Marshall, Sons, and Co. (limited), Gainsborough. Second of £20, Robey and Co. (limited), Lincoln. *Commended:* Ransomes and Sims, Ipswich; and Ruston, Proctor, and Co., Lincoln.

Grinding Mills, driven by horse or steam power, subject to thorough trials in crushing and grinding all descriptions of grain.—Prize of £20, Amies and Barford, Peterborough, for a Felton's American grist mill. *Commended:* H. Whiteley, Doncaster; and J. Hodgson, Duffield, Beverley.

The silver medal for the invention of any new and improved principle of construction as applied to farm implements, to Fowler and Co., Leeds, for their 8-horse power single cylinder engines, with self-moving and reversing gear.

Silver medals were also awarded to—

W. Tasker and Sons, Waterloo Iron Works, Andover, for application of chaff delivery to thrashing machines.

John Plant, Birley, Sheffield, for earth closet and commode.

Ransomes and Sims, Ipswich, for a six registered equalizing pomeltrees.

E. E. Allen, Westminster, for an 8-horse power patent double expansive portable steam engine.

#### MISCELLANEOUS.

£2, Ransomes and Sims, for Biddell's patent root pulper. £2, Ransomes and Sims, for a patent rotatory adjustable cleaning corn screen. £2, Marshall, Sons, and Co., for application of a mill to a thrashing machine. £2, Spencer and Co., Doncaster, for a potato planting machine. £2, W. Bushby, Newton, Bedale, for a plough and digger. £1, C. Topham, Birch-lane, London, for assortment of solid tire brushes for cleaning of boiler tubes. £2, W. Sawney, Beverley, for patent sack lifter and tilter. £2, R. Puckering, Beverley, for a market cart. £2, Amies and Barford, for patent turntable rollers. £2, Amies and Barford, for Proctor's patent straw elevator. *Highly commended:* Patterson and Co., Beverley, for compound action mill.

#### FOXHOUNDS.

Judges.—Capt. Percy Williams, Barnby Moor, Bedford.

Mr. W. H. Williams, Whitburn, Durham.

Sir Watkin W. Wynn, Bart., Wynnstay.

Three couples of entered hounds, of either or mixed sex, no hound being older than a seven season hunter, the Silver Champion Cup, value £20, Lord Wemyss; and to W. Channing, huntsman, a gratuity of £10. Second, a silver goblet, value £10, The Earl of Yarborough; and to Nimrod L. C. huntsman, a gratuity of £5. *Highly commended:* Mr. Scruton, a claret jug, value £10, Earl Fitzwilliam; and to Lord Ayris, jun., huntsman, a gratuity of £5. Second, a silver flask, value £5, Lord Hawke; and to E. Owen, huntsman, a gratuity of £2. *Highly commended:* Lord Wemyss.

Unentered dog hounds, pupped since 1st December, 1864, pair of silver claret cups, value £10, The Earl of Yarborough; and to Nimrod Long, huntsman, a gratuity of £5. Second, silver cigar case, value £5, Mr. Harcourt Johnstone; and to his huntsman a gratuity of £2.

Stallion hounds, not less than three-season hunters, and certified to be the sires of living puppies, pair of silver claret cups, value £10, Lord Wemyss; and to W. Channing, huntsman, a gratuity of £3. *Highly commended:* Lord Yarborough.

A Silver-mounted Hunting Whip, for the huntsman who brought hounds the longest distance to the show, was awarded to W. Channing, huntsman to Lord Wemyss.

There were also Prizes for Poultry.

**TRAINING THE AYBSHIRE.**—The show dogs of the Ayrshire men are inexhaustible, and not unattended with danger, as one man in his last twenty-four hours of a "strict preparation" fairly burst his bull. A great deal depends upon the jockeying during that time. A cow is generally kept shut set till four or five hours before the show. If she had been too fine food, her paunch would be drawn up, and the vessel would lean forward, and the teats not in position; whereas if the paunch is gradually filled in these last few hours, first by giving her common food, and then by coaxing her into quietude by bettering it at every supply, she is filled to repletion, and the vessel hangs taut and square. She often gets her pound of salt at night, and between the two agencies she should be turned out quite the thing in the morning. Cows are also kept well up to "tid" during the show season with gruel made of linseed-meal, oatmeal and flour, diluted with their own milk, and sometimes as much as 3lbs. of treacle in it. The shape of the vessel is also as carefully looked to and adjusted as the Spanish cock's comb, which was, while the fashion set that way, kept up in pasteboard splints, till just before going into Bingley Hall. A board is put below the vessel with holes for the teats, and tied with strings round the cow's back, so as to keep it in position, and the vessel is laved with cold water all night, to make it flat and contracted and give it consistency. They are also washed over with butter-milk, and the feet lights put in with soap and gum. Sometimes the cow barbers use butter-milk for the legs, and take to hair-oil, and the horses are rubbed with charcoal or hawthorn ashes, in accordance with an old superstition. In short, the day and night before the show are, in many instances, quite as important as an artistic glazing-day at the Royal Academy. The judges are all well up to "the little game," which extends to scraping noses, horns almost to the quick, and then japping them, and on all fours with that artistic clipping to hide weak points, against which old Val Barford, K.C.B. (Knight of the Clipping Board), struggled so long, till the Royal English Society issued its ukase.—"*Field and Fern, or Scottish Flocks and Herds*," by The Druid.



## THE HIGHLAND AGRICULTURAL SOCIETY.

## MEETING AT INVERNESS.

The appointment of Inverness as the place of meeting, by rotation, in 1865, had a peculiar significance. It was at this pleasant "key of the Highlands," in '46, that Mr. Hall Maxwell entered on the office of Secretary; and it is here, after a most eventful nineteen years, during which the number of members has increased from 2,569 to about 4,200, that he announces his retirement. Two meetings were held at Inverness prior to that of '46, Belville's year. In '31 the Highlanders mustered well, and the great "Corryhoyle descended from the mountain with his buck goats." In '39 the jealousy of the clans was aroused against the growing popularity of the short-horn crosses, and Mr. Wetherell stood forward, in a very hot discussion, as the champion of the "red, white, and roan." The meeting, in '56, was such a success that the Society once more settled to give up the biennial, which had been adopted since '48, and stand by an annual system. Time has worked wonders during those nine years. The mail-coachman no longer pulls up, to give his horses breath and the passengers a scenery treat, at the entrance of the Pass of Killiecrankie. Aberdeen is joined by the iron road to Inverness, with a branch line to Banff; the direct Highland Railway, when lairds and "masters" do not keep the train dawdling for their sovereign will and pleasure at the stations, makes short work of the once-dreaded 100 miles; and the Sutherland men take the train South at Meikle Ferry.

The business of the show commenced at 4 a.m. on Monday, with the meeting of the judges and the committee. Mr. Hall Maxwell stated that the entries consisted of 361 cattle, 132 horses and ponies, 812 sheep, 34 swine, 11 collie dogs, a new fettle, 294 head of poultry, and 707 implements, and that after careful examination by a V.S. not one of the animals, many of which, in consequence of the single train, did not arrive till Sunday, bore the slightest trace of disease. After dinner, Professor Anderson delivered a lecture on the Chemistry of Wool and its Management, and a slight discussion between the Highland and Lowland flockmasters on smearing and dipping appropriately closed the evening.

Owing to the unavoidable absence of Earl Rosslyn, the chair at the judges' early breakfast on Tuesday was taken by Earl Caithness. The morning brought with it something more than one of those Scotch mists which

"Wet the pair Scotchman to his sark,  
The Englishman to his skin,"

and the judges and their esquires had a very rough time of it. Excepting those who were specially interested in the cattle, few left their hotels, and only £151 9s. was taken at the gate in 10s. and 5s. payments. The show-yard was situated about 1½ miles from Inverness, on the farm of Seafeld; but the spot was a very exposed one, and great complaints were made by owners of cattle respecting the very insufficient shedding which was put up, despite the minute specifications made by Mr. Hall Maxwell, and the appointment of a professional architect. The banquet at the Music Hall was by far the most cheerful feature of the day. The chair was taken by the Duke of Argyll, who was dressed in the Celtic costume, and wore the Order of the Thistle, and the Duke of Athole, the Earl of Caithness, and nearly 450 other noblemen and gentlemen supported him. His Grace's four years of office now expire, and it seems quite understood that he

will be succeeded by the Duke of Richmond. The speech in which his Grace proposed the Highland Society chiefly consisted of a refutation of a lecture delivered by Mr. Leone Levi, an international jurist, upon the state of the Highlands; and he also stated officially that Government intended to apply to England and Scotland the same system of statistics which had proved so reliable in Ireland. In the course of his comments on the announcement made by Mr. Hall Maxwell, his Grace observed that, "during the whole course of its existence, the Society had never had a secretary of more energy, of more zeal, and of more efficiency," and proposed a vote of thanks to him for his services. This was responded to in a manner which showed how deep and abiding is the conviction of the services Mr. Maxwell has rendered to the Society, for whose sake he gave up a very high position as an advocate.

Even in a Scottish meeting all national prejudices are broken down, and the numbers in the catalogue begin to run with the shorthorns, of which there were 87 entries. Every shorthorn has departed months since from Athelstaneford. The brothers Mitchell, who were in such strength last year with Mistletoe and Blue Belle, sent nothing. Mr. Stirling's herd had not a solitary representative, and even the Brothers Cruikshank did not bring one to do battle from their 350. Still, in the old bull class, they won by proxy with Mr. James Geddes' British King, a good roan bull, but perhaps lucky from the fact that Fosco, the second to Van Tromp last year, had gone south to Doncaster. The commended bull Caractacus was also calved a few months after the dam left Sittyton. One of old "Reattie's" medal bulls, Viceroy, was second, and "Kinellar's" Prince of Worcester, the Challenge Cup bull at the Royal Northern the week before, had to be content with third honours. It was curious that in the two-year-old class, the Duke of Buccleuch's Royal Errant, Mr. Balfour's Prince Loth, and Lord Strathallan's Allan should be again in their Stirling order of merit. "The Royal" has not the masculine character of "The Prince," but the latter, who is more of a big framed steer getter, like his sire Great Seal, has rather "given" in his back, and Allan lacks scope and grandeur in his forehead. Lord Kinnaird's yearling bull Oxford Louis was better in his touch than any of them, and if Lord Strathallan could only again manage a third, his Rosa Bonheur, which had taken a third and a second before at these shows, worked up into the first place among the cows, where "Kinellar" was second, and Mr. McKesack's Lady Elma commended. In the two-year-old heifer class, Mr. Stephen, of Inchbroom, with his Emperor and Picotee blood, was second and third to "Reattie," and the combination of Prince Louis with Lord Privy Seal gave Lord Kinnaird a yearling heifer first with Princess Harriet. The Duke of Richmond was second with a daughter of Whipper-in's, one of the four first-prize Royal bulls which are stationed between John o'Groat's and Keir; and a daughter of Douglas's Illawatha furnished a third to Mr. Geddes in a good class.

The West Highlanders, headed by the first-prize aged bull and cow at Stirling and Kelso respectively, and each of them bred by the Marquis of Breadalbane, came out 88 strong, and formed along with the Leicesters the strongest features of the show. Both the first and third aged bulls were of Breadalbane



blood, and the former of them was the Duke of Athole's famous red Donald. His Grace was also first and third with his brindled Oscar and black Gille Dubh, and first and second with his cows Mhor and Proisag Odhar; while Mr. Allan Pollok took two firsts for his black "Willie" and his dun heifer "Sconard," and Mr. Malcolm, of Pottaloch, a first and a third. Mr. Peter, another purchaser of "Breadalbanes," had also two bronze medals for his portion; but even that was no light honour, in such an array.

Mr. McCombie, who had made a great week of it at Aberdeen with the polled and the fat cups, besides other prizes, marched northward with a heavy black brigade. The fifteen-year-old Charlotte and her daughter Pride of Aberdeen were there with Daisy, for the medium gold medals; and Sir George Macpherson Grant also sent his prize Perth cow, Mayflower of Montbletton, so as to enable the Angus-men to judge what "waste is made by time," which seems to touch this race very lightly. "Tillyfour" was never in greater force. Champion of his own and President 4th of Mr. James Lealie's breeding took first bull prizes for him; Lovely and Fancy, both daughters of The Belle, stood first and second in the cow-class; and his peerless Kate of Aberdeen, winner of the polled cup at Aberdeen, was first in the two-year-old heifer, and Bloom in the yearling heifer classes. Mr. Collie, of Ardgay, had a first and second for bulls, and "Portlethen," "Shielhill," "Easter Skene," and Lord Kinaird did not go empty away. Mr. McCombie's bull success was much greater than usual, as in the only bull-class in which he did not get a first (and was in fact well beaten), one of his own breeding, Press of Aberdeen, was second. Dahomey, a Stirling first, was among the old bulls, but took nothing this journey; and Lord Southesk made no entries whatever. No Galloway bulls were shown; but as, thanks to his Grace the Duke of Buccleugh, Messrs. Graham and Cunningham had the requisite four in each of the female classes, the breed was judged separately from the Angus. Mr. Cunningham with his Kate and Diana had the best of it, the other first-prize going to the Duke for Emblem, of his Grace's favourite Knight of Lyddesdale and Freebooter cross. Mr. Graham had no Semiramis or Harriet to confront her with this year, but he was second to Kate with two Hannibal cows.

Colly Hill of Battersa fame and Premium represented her Grace the Dowager Duchess of Athole in the gold medium medal ranks of the Ayrshires. The former, although nine years old, was giving four gallons a day in the height of the grass last year, and led everything in the Dunkeld dairy save Marion. In the cow in-milk and in-calf classes, her Grace made eleven out of the twenty-three entries, and won all six prizes. Whitelegs and Brookie, a second at Perth in his Grace's lifetime, were eligible in each class, and headed them accordingly; and Charner and Queen of Hearts were the other Dunkeld *prima donnas*. Mr. Stewart was first in the heifer class with Dainty, which was separated from one of the Duke of Hamilton's by a heifer of Mr. Donn's, and also first in the bull class with Royal Butterfly, a name which Towneley has so tended to popularize.

Fat stock are never out of season in Scotland, and there were sixty-three entries, or eighteen more than there were in the Ayrshire classes, and fifteen less than in the combined forces of the Black and all Black. The latter had a splendid representative in the extra class in a polled ox of Mr. Harris's, bred by "Lochdhu." "Tillyfour" was very sweet on this beast at the last Forres fat show, but Mr. Harris would not sell unless the black went as one of a large lot, at a price which would have seemed fabulous if Mr. Martin of Aberdeen had not given £94 10s. for a cross two-year-old steer this

spring, after a hot conflict with "Tillyfour," who had his revenge by beating it for the fat cup with a cross-bred at Aberdeen. There is no doubt that if Mr. Harris had held to his black, he would, with luck, have broken the six years' Smithfield charter, which Mr. McCombie holds for "the best Scot bullock." Flushed with his stock triumph, "Tillyfour" was determined that nothing should part them; and hence the four years and two months' specimen of ox-beef has quitted Earnhill for Tillyfour at £100. Mr. Harris, we deeply regret to say, has just had an accident with a turnip-pulper, which has deprived him of his right hand. Besides this poll, he showed a very grand shorthorn-cross ox, and took another first with him. Sir Alexander Cumming also came up strong with similar crosses, and beat the £94 10s. steer, among others. The Dunrobin Highlanders, which are said to have a title of fully two hundred years, were in their right place at the head of the Highland oxen class, with a fine home-bred black, and the brown and dun of Sir Alexander, both of which were bred by Mr. Archibald Stewart, of Duvegan, Skye, had to yield. Curiously enough, Inverness-shire itself wound up the cattle part of the show with a quartet of Alderneys, as if to make a milk protest in the teeth of the great beef-producing northern counties.

There was a satisfactory show of horses for agricultural purposes; and Mr. Steedman, one of the Plymouth bench, was again in office. Sir A. G. Cumming's prize mare at Inverness, in '56, came, as in duty bound, for her medium gold medal, and wore well for fourteen. In the old stallion class it was rather a question of form *versus* action between the winner, Mr. Sam Clark's horse, and Mr. Muir's. One had won at the Perth Union and the other at Glasgow this year; and the Dowager Duchess of Athole was third with her Diamond. In the three-year-olds, Mr. David Riddell won with a clever "General;" but the rack, like their seniors, was bad, and the strength of the Clydesdales centred on the two-year-old class, where Mr. Clark's winner made his mark, followed by good ones of Mr. Riddell's and Mr. Kaye's, the last being the only one bred by his exhibitor. It was a hard run match for first in the yearling colts, and as Mr. Young bred Young Baronet he retired from the bench. His colleagues could not agree, and Professor Dick and another V. S. from Inverness also went into opposite lobbies. The knotty point was then referred to the breeder of Thormanby and Dundee, who was one of the stewards in attendance, and he decided in favour of Young Baronet, a horse with not quite the bone and substance, but more lifting action than his antagonist; which was bred and owned by the Duke of Hamilton.

The first prize for Clydesdale mares with foal went, after a brief consultation, to a brown mare, Jean, the property of Mr. Fleming, of Kilkerran, well-known as a successful fancier of Arabs, Ayrshires, and Gordon setters, and as the purchaser of that Athole herd of West Highlanders, which made room for the Breadalbanes. Another "Jean" was second, and the Dowager Duchess of Athole again received the bronze medal. Mr. Fleming's other brown mare came to the fore in the mare-in-foal class, but it was a much "tighter fit" with a mare of Mr. Buchanan's, which had three years more on her head. The Duke of Hamilton won the three-year-old class with his Stirling filly, beating a filly by his own Sir Walter Scott very decidedly on the point of bone. In the next two classes Mr. Fleming was third and second, in the latter case with one of his own breeding, while Mr. David Riddell and Mr. Archibald Johnston stood in the first places. The Duke of Athole beat young Mr. Hope Johnstone of The Henk with his grey Glentilt in the pony-stallion class, and among the extras were a lot of Shetland ponies (as at Battersa) from Mr. Walker, of Maryfield House; and three thoroughbred stallions—one of them, Pulchi-

nello, from Marion, and Roebuck by General, who was commended.

The Border Leicester men pushed the strong advantage which they have gained at the Kelso and Edinburgh sales right up to the foot of the Highlands. Either the judges got puzzled, or the aged tup class was unusually level; but at all events, the judges took more than 1½ hours over it. Eventually, Mr. Ainslie, of Costerton, was placed first for a rather small but very perfect sheep, bred by Lord Polwarth, and Mr. Balfour, with one of his own breeding, and Mr. Rennie followed in order. There were fifty in the Dinmont class from nineteen exhibitors, and Mr. Purves, who sells 100 tups at Kelso each year, headed the poll with an admirable sheep. Mr. John Torrance and Simson, of Courthill, ranked next, and the former had also the reserve number. Mr. Purves made three entries, Mr. Simson four, and Mr. Torrance six. In the old ewe class, Mr. Ainslie won again, and he was also third in the gimmers, where Mr. Simson drew a-head of Mr. Purves. Lord Polwarth did not send anything. The Sutherlandshire breeders showed a very poor front when Mr. Brydon flung down the wager of battle to them at their own portals. In fact, the Moodlaw tups were the only good ones shown, and after clearing everything with them, including the reserve number in one class, and taking three prizes with the only three he had in the other, the remaining reserve number went to Mr. Robert Paterson, of Bighouse, near Thurso. In the class of ewes with lambs at their foot Mr. Brydon was also first with his only entry; Sir E. E. Montgomery and Mr. Shortreed, both lowlanders, were second and third; and then came a selection from Mr. Mitchell's Ribigill's ewes—so good a flock that the ewe cast sold recently at Falkirk at 31s. 6d. "Moodlaw," however, had to lower his colours in the gimmer class; and Captain John Fraser, of Balmaln, Inverness-shire, was the proud and happy man who did the deed. The blackfaces made a very grand show, as they were certain to do. Mr. Thomas Murray, of Eastside, Mr. John Archibald, of Overshiels, and Mr. Malcolm, of Poltalloch, principally rung the changes, except in the dinmonts, where "Overshiels" missed nothing but the reserve. The Duke of Richmond only showed Leicesters; and, in fact, they are gradually getting out of Southdowns at Gordon Castle; but still the old blood in Mr. Bruce's hands was strong enough to divide the Southdown honours with Mr. Scott Skirving, who has often had these classes pretty nearly his own way. Neither he nor Mr. Gibson could stand against Mr. Beale Brown, who came down, as is his annual wont, with Cotswolds, and added two more firsts for tups and ewes to his prize list. Mr. Reid was second to him in the old tup class with one which he purchased from him at Stirling last year; and Mr. Jonathan Peel showed his Lonks, some of which have been sold to cross with the blackface, and got a special recommendation for them. In Shropshires, the Glamis Trustees took the two firsts and a third, and Mr. Gibson the two seconds and a third. Brae Morry, a curious old breed of sheep "with roan face and legs, hairy wool, and as wild as a roe deer, and with lambs which are always yeanned with a yellowish-red spot on the shoulder and the tip of the tail," were also represented, and the sheep ranks were wound up by a "four-horned" tup from Lochmaddy.

There were thirty-four entries of pigs, but Mr. Findlay only took one prize for sows of the large breed. Two Berkshires were first and third in the large boar class, and in both classes for boars and sows of the small breed Mr. John Laing bore up well for the Kinross district. The lunatic asylums in the north of Scotland have always been rather famed for their good pig-feeding, but that at Elgin has enlarged its sphere, and came second with the best large boar. For the pen of large pigs under eight

months old it was a match between Rossie Priory and Hamilton Palace, and the former won with 5 months and 10 days to the good.

The new prizes for shepherds' dogs under six brought ten entries, but nine were in the dog class, where two handsome blacks were placed first and second.

Mr. Merry's only entry was made in a field of seventeen for coloured Dorkings; but a brother M.P., Mr. Dudley Marjoribanks, and also from Beaulieu, were more fortunate with his pens of game-fowl and Rouens. Mr. David Ainalie followed up his Leicester firsts with one for bantams; and Mrs. Ferguson Blair, the henwife *par excellence* of Scotland, did not enter or send a single bird. She has done enough for her fame without sending upwards of 100 miles for the sake of silver and bronze medals; and this is not the best time for plumage.

The show of implements was large, although 394 less than at Kelso, where the English makers had such a fine chance; and the horticultural department was very rich in seeds, samples of grasses, and plants, including several new importations of pines. The Howards, and Ramsomes and Sims had large stands of implements, as had Amies and Barford. Mr. Freer, of Rothley, sent a grain dibbling machine, and Mr. J. Ireland, of Manchester, an improved churn; and a digging machine was also there, said to be the invention of one Cicero Comstock, of Milwaukee. Special trains were run in large numbers, but at the end of the second day, the receipts were only £437, or £543 behind Stirling, which had Glasgow and Edinburgh for its "feeders."

## PRIZE LIST.

### CATTLE.

#### SHORTHORNS.

JUDGES.—Thomas Hunt, Thornington, Coldstream.  
Nicol Milne, of Faldonside, Melrose.  
Andrew Mitchell, Alloa.

Bulls calved before 1st January, 1863.—Breeder of best Bull, Silver Medal. First prize, £20, James Geddes, Orbliston, Fochabers. Second of £10, Andrew Longmore, Rennie, Banff. Third, Bronze Medal, Silvester Campbell, Kinellar, Blackburn, Aberdeen.

Bulls calved after 1st January, 1863.—First prize, £20, Duke of Buccleuch and Queensberry, K.G., Dalkeith Park, Dalkeith. Second of £10, Arthur James Balfour, of Whittingham, Prestonkirk. Third, Bronze Medal, Viscount Strathallan, Strathallan Castle, Auchterarder.

Bulls calved after 1st January, 1864.—First prize, £10, Lord Kinneir, K.T., Rossie Priory, Inchture. Second of £5, Henry Gray, The Maina, Cushnie, Alford, Aberdeenshire. Third, Bronze Medal, Viscount Strathallan, Strathallan Castle, Auchterarder.

Cows of any age.—First prize, £15, Viscount Strathallan. Second of £8, Silvester Campbell. Third, Bronze Medal, David Ainalie, of Costerton, Blackhills.

Heifers calved after 1st January, 1863.—First prize, £10, Andrew Longmore, Rennie, Banff. Second and third, £5 and Bronze Medal, William Stephen, Inchbroom, Elgin.

Heifers calved after 1st January, 1864.—First prize, £8, Lord Kinneir, K.T., Rossie Priory, Inchture. Second of £4, The Duke of Richmond, Gordon Castle, Fochabers. Third, James Geddes, Orbliston, Fochabers.

#### HIGHLAND.

JUDGES.—R. D. Campbell, of Jura.  
Donald Macleod, Coumloire, Inverness.  
John M'Laren, Monzie, Blair Athole.

Bulls calved before 1st January, 1863. Breeder of best bull Silver Medal.—First prize, £30, The Duke of Athole, Blair Castle, Blair Athole. Second of £10, Duncan Macpherson, Kingussie. Third, Bronze Medal, Robert Peter, Inver, Aberfeldy.

Bulls calved after 1st January, 1863.—First prize, £30, Allan Pollok, Ronachan, Clachan Cantire. Second of £10, Alexander Cameron, Campbell of Monzie, Kinloch Lodge, Fort-William. Third, Bronze Medal, John Stewart, Duntulm, Portree.

Bulls calved after 1st January, 1863.—First prize, £10, The Duke of Athole. Second of £5, Alexander Fraser, Fallie, Inverness. Third, Bronze Medal, The Duke of Athole.

Cows of any age.—First prize, £15, The Duke of Athole.

Second of £8, The Duke of Athole. Third, Bronze Medal, John Malcolm, Poltalloch, Callton Mor, Lochgilphead.

Heifers calved after 1st January, 1863.—First prize, £10, Allan Pollok. Second of £5, John Stewart, Duntulm, Portree. Third, Bronze Medal, John Malcolm.

Heifers calved after 1st January, 1863.—First prize, £8, John Malcolm. Second and third, £4 and Bronze Medal, Robert Peter.

#### POLLED ANGUS, ABERDEEN, AND GALLOWAY.

JUDGES.—Robert Hector, Montrose.

George Milne, Haddo.

A. C. Pagan, Innergeldie, Comrie.

Bulls calved before 1st January, 1863.—Breeder of best Bull, Silver Medal. First prize, £20, William M'Combie, Tillyfour, Aberdeen. Second of £10, Robert Walker, Hillside House, Portlethen, Aberdeen. Third, Bronze Medal, Alexander Morison, of Bognie, Mountblairy House, Turriff.

Bulls calved after 1st January, 1863.—First prize, £20, William M'Combie. Second of £10, John Collie, Ardgay, Forres. Third, Bronze Medal, Thomas Lyall, Shielhill, Kierriemuir.

Bulls calved after 1st January, 1864.—First prize, £10, John Collie, Ardgay, Forres. Second of £5, D. R. Lyall Grant, of Kingsford, Alford, Aberdeenshire. Third, Bronze Medal, William James Taylor, Rothiemay House, Huntly.

Cows of any age.—First prize, £15, William M'Combie. Second of £5, William M'Combie. Third, Bronze Medal, Robert Walker.

Heifers calved after 1st January, 1863.—First prize, £10, William M'Combie, Tillyfour, Aberdeen. Second of £5, William M'Combie, of Easter Skene. Third, Bronze Medal, Lord Kinnaird, K.T., Rossie Priory, Inchture.

Heifers calved after 1st January, 1864.—First prize, £8, William M'Combie, Tillyfour, Aberdeen. Second of £4, Robert Walker, Mountbleton, Banff. Third, Bronze Medal, John Collie, Ardgay, Forres.

#### AYRSHIRE.

JUDGES.—John Baird, of Ury, Stonehaven.

Peter Drew, Carmyle, Tollcross, Glasgow.

Duncan Macfarlane, Torr, Helensburgh.

Bulls calved after 1st January, 1862.—Breeder of best Bull, Silver Medal. First prize, £20, John Stewart, Burnside Cottage, Strathaven. Second of £10, Robert Wilson, Nether Johnstone, Kilbarchan. Third prize withheld.

Cows in-Milk, of any age.—First prize, £10, second of £5, and third, Bronze Medal, The Dowager Duchess, of Athole, Dunkeld.

Cows in-Calf, of any age.—First prize, £10, second of £5, and third, Bronze Medal, The Dowager Duchess of Athole.

Heifers calved after 1st January, 1863.—First prize, £10, John Stewart. Second of £5, William Dunn, of Dalmarie, Tarbolton. Third, Bronze Medal, The Duke of Hamilton.

#### FAT STOCK.

JUDGES.—John Dudgeon, Almondhill, Kirkliston.

Thomas Middleton, Davidson, Cromarty.

J. Stewart Menzies, of Chesthill, Aberfeldy.

Oxen of any Pure or Cross Breed, calved after 1st January, 1862.—First prize, £8, Richard Heath Harris, Earnhill, Forres. Second of £4, Walter Scott, Glendronach, Huntly.

Oxen of any Pure or Cross Breed, calved after 1st January, 1863.—First prize, £8, second of £3, Sir Alexander P. Gordon Cumming, of Altyre, Bart., Forres. Third, Bronze Medal, J. and W. Martin, Aberdeen.

Oxen of any Pure or Cross Breed, calved after 1st January, 1864.—First prize, £4, Sir Alexander P. Gordon Cumming, of Altyre, Bart. Second, of £2, David Ainslie, of Costerton, Blackshiels. Third, Bronze Medal, John Ferguson, East Grange, Forres.

Highland Oxen calved after 1st January, 1861.—First prize, £8, James Gordon, of Manar, Keith-Hall. Second of £4, Andrew Longmore, Rottie, Banff. Third, Bronze Medal, Archibald Stewart, Claigra, Dunvegan, Skye.

Highland Oxen calved after 1st January, 1862.—First prize, £8, The Duke of Sutherland, K.G., Dunrobin Castle, Golspie. Second of £3, and third, Bronze Medal, Sir Alexander P. Gordon Cumming, of Altyre, Bart.

Cross Heifers, calved after 1st January, 1863.—First prize, £8, Henry A. Rennie, Mill of Boyndie, Banff. Second of £3, Edward Tew, Coul Cottage, Alness. Third, Bronze Medal, Sir Alexander P. Gordon Cumming, of Altyre, Bart.

Cross Heifers calved after 1st January, 1864.—No award.

#### HORSES.

##### FOR AGRICULTURAL PURPOSES.

JUDGES.—James Salmon, Benston, Paisley.

James Steedman, Boghall, Roslin.

Alexander Young, Keir Mains, Dunblane.

Stallions foaled before 1st January, 1862.—First prize, £30, Samuel Clark, Manswrae, Kilbarchan. Second of £15, James Muir, Hardington Mains, Wiston, Biggar. Third, Bronze Medal, The Dowager Duchess of Athole, Dunkeld. Breeder of best Stallion, Silver Medal.

Entire Colts foaled after 1st January, 1862.—First prize, £20, David Riddell, Kilbowie, Duntocher. Second of £10, Andrew Wilson, Whiteside, Alford. Third, Bronze Medal, William Murray, Kilcoy, Redcastle, Killearnan, Inverness.

Entire Colts foaled after 1st January, 1863.—First prize, £15, Samuel Clark. Second of £8, David Riddell. Third, Bronze Medal, James Kay, Hill Farm, Gargunnoch.

Entire Colts foaled after 1st January, 1864.—First prize, £10, Robert M'Keen, Lumloch, Bishopbriggs. Second of £4, The Duke of Hamilton and Brandon, Hamilton Palace, Hamilton.

Mares (with Foal at foot) foaled before 1st January, 1862.—First prize, £20, Peter Beattie, Insch, Aberdeenshire. Second of £10, John Hendrie, Castle Leathers, Inverness. Third, Bronze Medal, The Dowager Duchess of Athole, Dunkeld.

Mares (in Foal) foaled before 1st January, 1862.—First prize, £15, J. N. Fleming, Kilkerran House, Maybole. Second of £8, Alexander Buchanan, Garscadden Mains, New Kilmpatrick.

Fillies foaled after 1st January, 1862.—First prize, £10, The Duke of Hamilton and Brandon. Second of £5, Alexander Murdoch, Hilton, Bishopbriggs. Third, Bronze Medal, Alexander Stewart, Bog of Cawdor, Nairn.

Fillies foaled after 1st January, 1863.—First prize, £8, David Riddell. Second of £4, Alexander Buchanan. Third, Bronze Medal, J. N. Fleming.

Fillies foaled after 1st January, 1864.—First prize, £8, Archibald Johnston, Lochburn, Maryhill, Glasgow. Second of £3, J. N. Fleming. Third, Bronze Medal, Hugh A. Gair, Hilton, Inverness.

#### PONIES.

JUDGES.—Sir Alexander P. Gordon Cumming, of Altyre, Bart. Major Horne, of Stirrhook, Wick.

Pony Stallions, not exceeding 14 hands.—First prize, £18, The Duke of Athole, Blair Castle, Blair-Athole. Second of £5, Charles Hope Johnston, the Hawk, Lockerbie. Third, Bronze Medal, Donald MacLeod, Coulmore, Inverness.

Pony Mares, not exceeding 14 hands.—First prize, £8, John Baillie Baillie, of Leys, Inverness. Second of £4, Fountain Walker, of Foyers, Muirton, Inverness. Third, Bronze Medal, Hugh Mackenzie, of Dundonnell, Ullapool.

#### SHEEP.

##### LEICESTER.

JUDGES.—Joseph Bell, Scalehill, Lazonby, Penrith.

Peter Reid, Drumfark House, Helensburgh.

John Wilson, Edington Mains, Chirnside.

Tups not above Four Shear.—First prize, £10, David Ainsley, of Costerton, Blackshiels. Second of £5, Arthur James Balfour, of Wittingham, Prestonkirk. Third, Bronze Medal, Henry A. Rennie, Mill of Boyndie, Banff.

Dinnont or Shearling Tups.—First prize, £10, William Purves, Linton Burnfoot, Kelso. Second of £5, George Terence, Sisterpath, Dunse. Third, Bronze Medal, George Simson, Courthill, Kelso.

Ewes not above Four Shear.—First prize, £8, David Ainslie. Second of £4, John Garland, Cairnton, Fording. Third, Bronze Medal, Thomas Ferguson, Kinnochtry, Comrie, Angus.

Shearling Ewes or Gimmers.—First prize, £8, George Simson. Second of £4, William Purves. Third, Bronze Medal, David Ainslie.

##### CHEVIOT.

JUDGES.—William Aitchison, Linhope, Hawick.

Mr. William Purves, Linton, Burnfoot.

Alexander Denholm, Baildaws, Biggar.

Tups not above Four Shear.—First prize, £10, James Brydon, Moodlaw, Langholm. Second of £5, James Brydon, jun., Kinneilhead, Moffat. Third, Bronze Medal, James Brydon, Moodlaw, Langholm.

Dinnont or Shearling Tups.—First prize, £10, Second of £5, Third, Bronze Medal, James Brydon, jun.

Ewes not above Four Shear, with Lambs at Foot.—First prize, £8, James Brydon. Second of £4, Sir G. Graham Montgomery, of Stanhope, Bart., M.P., Stobo Castle, Peebles. Third, Bronze Medal, Robert Shortreed, Attonburn, Kelso.

Shearling Ewes or Gimmers.—First prize, £8, Sir G. Graham Montgomery, of Stanhope, Bart., M.P. Second of £4, James Brydon. Third, Bronze Medal, John Archibald, Glenelg, Leader.

##### BLACKFACED.

JUDGES.—Alexander Denholm, Baildaws, Biggar.

John M'Laren, Monzie, Blair-Athole.

Tups not above Four Shear.—First prize, £10, Thomas Murray, Eastside, Penicuik. Second of £5, John Archibald, Overashiels, Stow. Third, Bronze Medal, Allan Cunningham Pagan, Innergeldie, Comrie, Crieff.

Dinnont or Shearling Tups.—First prize, £10, Second of £5, Third, Bronze Medal, John Archibald.

Ewes not above Four Shear, with Lambs at Foot.—First

prise, £3, John Malcolm, of Pottalloch, Callton Mor, Loch-gilthead. Second of £4, Allan Cunningham Pagan. Third, Bronze Medal, James M'Pherson, Drumore, Ardersier. Best Pen of Lambs, Silver Medal.

Shearling Ewes or Gimmers.—First prize, £3, Thomas Murray, Reside, Penicuik. Second of £4, John Archibald. Third, Bronze Medal, John Malcolm.

#### SOUTHDOWNS.

JUDGES.—Robert Elliot, Laighwood, Dunkeld.  
William Goodlet, Bolshaw, Arbroath.

Tups not above Four Shear.—First prize, £10, James Bruce, Burnside, Fochabers. Second of £5, D. R. Williamson, of Lawers, Crieff. Third, Bronze Medal, Robert Scott Skirving, Camptoun, Drem.

Ewes not above Four Shear, or Gimmers.—First prize, £3, Robert Scott Skirving. Second of £4, Jas. Bruce. Third, Bronze Medal, Robert Scott Skirving.

#### LONG-WOOLLED OTHER THAN LEICESTER.

JUDGES as for Leicester.

Tups not above Four Shear.—First prize, £10, Thomas Beale Brown, of Salperton Park, Andoversford, Gloucestershire. Second of £10, Walter Reid, Drem. Third, Bronze Medal, Thomas Beale Brown.

Ewes not above Four Shear, or Gimmers.—First prize, £3, Thomas Beale Brown. Second of £4, John Gibson, Woolmet, Dalkeith. Third, Bronze Medal, Robert Scott Skirving, Camptoun, Drem.

#### SHORT-WOOLLED OTHER THAN SOUTHDOWN.

JUDGES as for Southdowns.

Tups not above Four Shear.—First prize, £10, Andrew Ralston, for the Glamis Trustees, Glamis House, Glamis. Second of £5, and Third, Bronze Medal, John Gibson, Woolmet, Dalkeith.

Ewes not above Four Shear, or Gimmers.—First prize, £3, Andrew Ralston, for the Glamis Trustees. Second of £4, John Gibson. Third, Bronze Medal, Andrew Ralston, for the Glamis Trustees.

#### CROSS.

Shearling Wethers of any Cross.—First prize, £3, John Hunter, Dipple, Fochabers. Second of £3, Alexander Ronald, son, Little Gight, Methic. Third, Bronze Medal, Sir Alexander P. Gordon Cumming, of Altyre, Bart., Forres.

Lambs of any Cross.—First prize, £4, A. and A. Cowan, 5, Bridge-street, Inverness. Second of £3, Edward Tew, Coul Cottage, Alness. Third, Bronze Medal, John Ferguson, East Grange, Forres.

#### SWINE.

JUDGES.—Thomas Begbie, Queenston Bank, Drem.  
David Mundell, Auchindrean, Lochbroom.  
Robert Anderson, of Lochdhu, Nairn.

Boars, large breed.—First prize, £3, Andrew Ralston, for the Glamis Trustees, Glamis House, Glamis. Second of £4, James Reid, Lunatic Asylum, Elgin. Third, Bronze Medal, Donald Cameron, of Lochiel, Achnacroary Castle, Fort-William.

Boars, small breed.—First prize, £3, John Laing, Glen-deuglie, Milnathort, Kinross. Second of £4, William Steven, Inchbroom, Elgin. Third, Bronze Medal, Colonel William Fraser Tytler, of Aldourie, Inverness.

Sows, large Breed.—First prize, £3, Thomas D. Findlay, Easterhill, Glasgow. Second of £3, Captain A. M. Clarke, Meddat, Parkhill, Inverness. Third, Bronze Medal, The Duke of Hamilton and Brandon, Hamilton Palace, Hamilton.

Sows, small breed.—First prize, £3, John Laing. Second of £3, Alexander Simpson, Seafeld, Inverness.  
Pens of three Pigs, not exceeding eight months old (large Breed).—First prize, £4, The Duke of Hamilton and Brandon, Hamilton. Second of £2, Lord Kinnaird, K.T., Rossie Priory, Inchture.

## THE DURHAM AGRICULTURAL SOCIETY.

### MEETING AT DURHAM.

The twenty-third annual show of the Durham County Agricultural Society was held on Aug. 8th; while the last show of the society, forming the twenty-second, was held at Gateshead two years since, no show taking place last year, in consequence of the meeting of the Royal Agricultural Society at Newcastle. Everything considered—keeping in view the many excellent meetings the society has had, and the fact that a larger number of entries were looked for in some of the classes—this meeting can scarcely be described as being superior to those which have preceded it.

In point of numbers, the shorthorns made a poor show; but so far as quality is concerned, a better display could scarcely have been desired. Every animal might, with credit to its owner, have taken a prize; and, indeed, the majority had already taken honours at previous exhibitions. Chief amongst these was the celebrated roan cow Corinne, the property of Mr. John Wood, Stanwick Park, Darlington. This animal took first prize at the Royal show at Plymouth this year; and, of course, she did not fail to secure the first prize at Durham. There were seven entries in class one, for the best bull of any age. Two prizes were given, the first of which was awarded to Mr. T. C. Booth's Prince Charlie, and the second to Mr. W. Lambert's Pizarro; but so excellent were the whole seven animals that the judges, after a somewhat lengthened consultation, resolved that the whole class should be commended. The other animals were Surly, belonging to Mr. John Newton, Hexham; Royal Butterfly 18th, belonging to Messrs. Stephenson and Coulson, Hexham; Earl of Derby, belonging to Mr. Samuel Wiley, Bransby, Yorkshire; Bywell Victor, belonging to George Atkinson, Seaham Hall Farm; and Lord Pam, the property of Mr. J. R. Middlebrough, South Milford, Yorkshire. Another Plymouth prize winner competed in class 4, and gained the first prize as the best two-year-old heifer in calf—namely, Mr. C. T. Booth's Lady Fragrant, which also took honours at the late show at Doncaster, and at the Peterboro' show. Mr. T. Jolly's Empress of the Isles, which has been successful in nearly every show at which she has been exhibited, took the first prize as the one-year-old heifer. The second prize in the class for heifer-calves was awarded to Mr. M. Stephenson's Miss Beverley 17th, which headed the list at Hexham the

preceding day; while the first prize was given to Miss Beverley 18th, the property of the same gentleman, which, strangely enough, came off second best at Hexham. In the shorthorn section, a piece of plate of the value of one hundred guineas is given annually by the society, and competed for on the conditions mentioned in the prize-list. This cup was won in 1860, at Bishop Auckland, by Captain Gunter's Duchess 77th; at Darlington, in 1861, by Mr. Richard Booth's Sailor Bride; at Sedgfield, in 1862, by Mr. Booth's Queen of the Ocean; and at Gateshead, in 1863, by Lady Pigot's Rosedale. This year it has been won by Mr. T. C. Booth's Lady Fragrant. A piece of plate of the value of twenty-five guineas is given as a second prize, and competed for on similar conditions. The prize was won in 1860, at Bishop Auckland, by Mr. Jeffrey Bulmer's Earl of Derby the 2nd; at Darlington, in 1861, by Mr. Jeffrey Bulmer's Princess Royal 2nd; at Sedgfield, in 1862, by Mr. G. Atkinson's white heifer, Snowdrop; and at Gateshead, in 1863, by Mr. G. Atkinson's Ringlet. This year it has been won by Mr. J. W. Botcherby's White Cherry, calved 21st July, 1863, and which competed unsuccessfully in class 4.

The show of horses was in every respect an excellent one—by far the most important the society has had for some time, the entries in every class being at once numerous and good. Mr. Joseph Webster took the prize of £20 for his blood stallion, Strathern; while the first prize for cart stallions was gained by Mr. Matthew Reed, Beamish Burn, for England's Glory. The first prize for three-year-old colts for the field was given to Buffon, the property of Mr. J. B. Booth, Killyby, an animal which took the first prize at Darlington and Guisborough. Previous prize winners in fact were very numerous, it being no uncommon circumstance to come upon two or three in each class. Among the more important of these which also took prizes yesterday were a two-year-old bay filly, belonging to Mr. J. W. Pease, Darlington; the yearling colt, Bird of Passage, belonging to Mr. J. B. Booth; and a yearling cart filly, belonging to Mr. Wm. Dickman, Fence Houses.

A number of animals were exhibited as extra stock. Among these were several fine ponies and horses, an Alderney bull, one pair of Brittany, one pair of Alderney, and one pair of Hereford cows, one Kerry cow, and a pen of Shropshire lambs.

In the same class two beautiful Newfoundland dogs and one or two pairs of golden and silver pheasants were also exhibited. The extra stock proved a great attraction to visitors. No prizes were given, but several of the animals were marked highly commended.

The show of pigs and poultry was an exceedingly good one, but of sheep the display was very short in numbers. The quality of the latter, however, was fully up to the average, and the prizes were gained by really fine specimens of the Leicester breed.

There were eleven stands of implements upon the ground, and, in accordance with an arrangement come to, the implement committee were empowered to award prizes to any agricultural implement on a new and improved principle of construction, and combining efficiency, simplicity, and economy, which may be recommended by the judges, provided the amount does not exceed £5. The exhibitors were Mr. J. Weighill, Albert Foundry, Pickering; Mr. T. E. Colgrave, Newcastle-upon-Tyne; Mr. John Richardson, Carlisle; Mr. N. Willis, Hutton-le-Hole; Mr. John Bamlet, West Scarborough; Mr. J. Malcolm, Durham; Messrs. C. Scott and Son, Felton; Mr. W. Bushby, Newton; Mr. John Boyd, Durham; Mr. John Dickinson, Durham, &c. Prizes of 10s. each were awarded—1st, for an eclipse one horse-power reaping machine, with two knives, price £17 18s. 6d.; 2nd, for an oilcake breaker, price £4 14s. 6d.; 3rd, for an oat and bean crusher; and 4th, for a sheep rack. A prize of £1 was given to Mr. Richardson, Carlisle, for a winnowing machine exhibited by him, price £7 10s. A prize of £1 each was given for the following articles exhibited by Mr. Gregory:—1st, a Wood's patent grass mower, which received the first prize at the Royal Agricultural Society's show at Plymouth; 2nd, a Wood's patent drop board reaper, which also received a first prize at Plymouth; 3rd, a Bamlet's patent combined reaper and mower. A prize of £2 was given to Mr. Willis for a reaping machine and a horse hay-rake with steel teeth; a prize of 10s. to Mr. Bamlet, for a double mould-board plough; a prize of £1 to Mr. Bushey, for a reaping machine and a plough and digger; and £1 to Mr. Boyd, for a stand of ironmongery.

The judges were: For cattle, sheep, and pigs—Mr. Raine, Morton, Tinnmouth; Mr. Dent; Archdeacon Newton; and Mr. Scott, Broom Close. For horses—Mr. Turnbull, Under Lee; Mr. Wilkinson, Wittonstall; Mr. Hodgson, Bramper; Mr. J. Wood, Stanwick Park; Mr. J. Furness, Coshoe; and Mr. Bolam. For implements and poultry—The Committee.

The annual dinner took place in the Durham Town Hall in the evening, under the presidency of the chairman of the society, Sir Hedworth Williamson, Bart., M.P., and there was a large attendance.

#### PRIZE LIST, CATTLE.

##### SHORTHORNS.

A piece of plate, of the value of 100 guineas, to the owner of the best Shorthorn breeding animal (of either sex) exhibited, and to become the absolute property of the person who shall win it three years in succession.—T. C. Booth (Lady Fragrant).

A piece of plate of the value of 25 guineas.—J. W. Botcherby (White Cherry).

Bulls of any age.—First prize, 20*l.*, T. C. Booth, Warlab, Northallerton (Prince Alfred). Second of 5*l.*, W. Lambert, Elrington Hall (Pizarro).

Bulls under two years old.—Second prize, 5*l.*, T. C. Booth, Warlab, Northallerton (Commander-in-chief).—*No competition.*

Cows, in-calf or milk, having had a calf within the last twelve months.—First prize, 10*l.*, J. Wood, Stanwick Park, Darlington (Corinne). Second of 5*l.*, W. Lambert (Queen of Beauty).

Two-year-old Heifers, in-calf.—First prize, 6*l.*, T. C. Booth (Lady Fragrant). Second of 3*l.*, J. Wood (Clotilde).

One-year-old Heifers.—First prize, 4*l.*, T. Jolly, Warlab, Northallerton (Empress of the Isles). Second of 2*l.*, G. Atkinson, Seaham Hall Farm (Julia 2nd).

Bull-calves under twelve months old.—First prize, 3*l.*, T. C. Booth, Warlab, Northallerton (Prince Christian). Second of 1*l.*, W. Coxon, Plawsworth, Durham (Ariel).

Heifer-calves under twelve months old.—First prize, 3*l.*, M. Stephenson, Fourstones, Hexham (Miss Beverley 18th). Second of 1*l.*, M. Stephenson (Miss Beverley 17th).

#### LEICESTER OR LONG-WOOLLED SHEEP.

Rams of any age.—Prize, 5*l.*, J. Simpson, Spofforth Park, Wetherby.—*Two entries.*

Shearing Rams.—Prize of 5*l.*, J. Simpson.

Pens of five Ewes having reared lambs this year.—Prize of 3*l.*, J. Simpson.

Pens of five Shearling Gimmers.—Prize of 3*l.*, J. Simpson.

#### PIGS.

Boars, large breed.—Prize of 3*l.*, R. Duckering, Northorpe, Kirton Lindsey.

Boars, small breed.—Prize of 3*l.*, George Mangies, Givendale, Ripon.

Sows, large breed.—Prize of 2*l.*, R. Duckering.

Sows, small breed.—Prize of 2*l.*, G. Mangies.

#### HOBBES.

Blood Stallions.—Prize of 20*l.*, J. Webster, Allerton, Pickering (Strathern).

Cart Stallions.—Prize of 20*l.*, M. Reed, Beamish Burn, Chester-le-Street (England's Glory).

Brood Mares, for saddle.—Prize of 5*l.*, J. W. Pease, Darlington.

Harness Mares.—Prize of 5*l.*, W. and F. Coulson, Gaterly Farm, Castle Howard (Venus).

Cart Mares.—Prize of 5*l.*, J. M. Pattison, Norwood.

Sweepstakes of 5s. each, with 2*l.* added, for Foals for the saddle.—J. W. Pease, Darlington.

Sweepstakes of 5s. each, with 2*l.* added, for Foals for harness.—W. and F. Coulson, Gaterly Farm, Castle Howard, York (Vesta).

Sweepstakes of 5s. each, with 2*l.* added, for Cart Foals.—George Hobson, Harperley Mills.

Three-year-old Colts for the field.—Prize of 5*l.*, J. B. Booth, Killerby, Catterick (Buffon).

Three-year-old Fillies for the field.—Prize of 5*l.*, J. Atkinson, Low Beaumont Hill.

Three-year-old Colts for harness.—Prize of 5*l.*, George Robinson, Marton, Middlesbro'.

Three-year-old Fillies for harness.—Prize of 5*l.*, W. and F. Coulson (Violet).

Three-year-old Cart Colts.—Prize of 5*l.*, Robert Bird, Brierton.

Three-year-old Cart Fillies.—Prize of 5*l.*, John Crawford, Lumley.

Two-year-old Colts for the field.—Prize of 4*l.*, J. B. Booth, Killerby.

Two-year-old Colts for harness.—Prize of 4*l.*, C. L. Wood, Howlish Hall.

Two-year-old Fillies for harness.—Prize of 4*l.*, John Jackson, jun., Cliff House, Great Ayton, Northallerton.

Two-year-old Cart Colts.—Prize of 4*l.*, F. Potts, Orington, Northumberland.

Two-year-old Cart Fillies.—Prize of 4*l.*, J. W. Pease, Woodlands.

Yearling Colts for the field.—Prize of 3*l.*, J. B. Booth.

Yearling Fillies for the field.—Prize of 3*l.*, J. Walker, Acklam, Middlesbro'.

Yearling Colts for harness.—Prize of 3*l.*, C. L. Wood.

Yearling Fillies for harness.—Prize of 3*l.*, J. Jackson, jun.

Yearling Cart Colts.—Prize of 3*l.*, Forster Potts, Orington, Northumberland.

Yearling Cart Fillies.—Prize of 3*l.*, William Dickman, Lumley, Fence Houses.

Mares or Geldings not more than eight years of age, qualified to carry 12 stones with hounds, and warranted sound at the time of entry.—George H. Burnett, Blaydon-upon-Tyne (Verdant Green).

Roadsters, Mares, or Geldings not more than eight years old.—Prize of 10*l.*, George Mulcaster, Housenrigg, Aspatria, Cumberland (mare—Crafty).

#### EXTRA STOCK.

Highly commended: H. J. Baker, Esq., Elmore Hall (black mare Exmoor pony); H. Marshall, Sands House (horse pony); H. R. Webster, Morton House (pony); John Holt, Skinner-street, Stockton (pony by The Cure); E. and N. Richardson, Sunderland (draught horse—Buck).

Cows.—Highly commended: H. Marshall, Sands House, Durham (pair of Brittany cows and pair of Alderney cows).

Viscount Boyne, Brancepeth Castle (pair of Hereford cows). Sheep.—Highly commended: Viscount Boyne, Brancepeth Castle (pen of Shropshire lambs).

## NORTH LANCASHIRE AGRICULTURAL SOCIETY.

## MEETING AT ACCRINGTON.

This show was held on August 13th, when the attendance of visitors was numerous, considering the weather, which was threatening throughout the day. As a whole, the meeting proved inadequate to the expectations of the Council. Compared with previous years, the entries were not so large; and among the Shorthorns, a number of persons who had entered failed to exhibit. The cause of absence is probably attributable to several local shows being held within a comparatively few days of each other. Implements were also more select than numerous. They included a few new features in chaff cutters, root cutters, and pulpers. The judges were—Implements: Messrs. Roberts, Boulton, and Addie. Cattle: Messrs. Tallant, Dudda, and Patterson. Horses: Messrs. Bromley, Morphet, and Brewer. Sheep and pigs: Messrs. Jefferson, Bradbury, and Baxter. Butter, cheese, roots, and seeds: Messrs. Walker, Melling, Logan, and Cartmell. Poultry: Messrs. Hindson and Foulds.

The following are the principal prizes:

**IMPLEMENTS.**—Best mowing machine, Society's silver medal and £10, Kearsley, Ironworks, Ripon. Second best, Society's silver medal and £5, Richmond and Chandler, Salford. Best collection of agricultural implements, £10, Pickaley, Sims, and Co., Leigh, Lancashire. Second best, £5, Richmond and Chandler.

**CATTLE.**—Shorthorns: Bulls two years old or upwards, Society's medal and £10, J. Taylor, Moreton, Whalley. The class commended. Bull above one and under two years, Society's silver medal and £10, P. H. Fawkes, Otley. Bull calf under twelve months, Society's silver medal and £3, Dugdale and Sons, Mytton Bridge, Whalley. Cow or heifer above three years old, and in calf or milk, £5, A. Dugdale, Rose Hill, Burnley. Heifer above two and not exceeding three years, £3, Lady Pigot, Branches Park, Newmarket. Heifer not exceeding two years, £3, Lady Pigot. Heifer calf, £2, B. Baxter, Elslack Hall, Skipton. Cattle of any breed: Bull two years and upwards, Society's silver medal and £10, W. Boulton, Park House, Dalton-in-Furness. Bull above one and under two years, Society's silver medal and £10, F. Leach, Brongerley, Clitheroe. Bull calf under twelve months, £3, Dugdale and Sons. Cow in calf or milk, having had a calf, and above three years, £5, O. W. Brierley, Rhodes House, Middleton. Three dairy cows, £5, L. C. Wood, Singleton Lodge, Kirkham. Heifer not exceeding three years, and in calf or milk, £5, M. Noble, Great Harwood, Accrington. Three heifers two years old and not exceeding three, £5, J. Woodhouse, Scale Hall, Skerton. Heifer not exceeding two years, £3, R. C. Richards, Clifton Lodge, Preston. Three heifers one year old and not exceeding two, bred by exhibitor, £5, R. C. Richards. Heifer calf, £2, Baxter. Three heifer calves not exceeding one year, bred by exhibitor, £5, B. Baxter. Extra stock: C. W. Brierley. Cup, value 20 guineas, for the best bull, any age: F. H. Fawkes, Otley. Cup, value 20 guineas, for the best female animal, any age: A. Dugdale.

**HORSES.**—Stallion for waggon or dray purposes, Society's silver medal and £10, R. J. Robinson, Broughton, Manchester. Stallion for agricultural purposes, Society's silver medal and £10, J. Wallworth, Clifton, Manchester. Thorough-bred stallion, Society's silver medal and £20, J. M. Grainger, Whitehall, Clitheroe. Roadster stallion, not thorough-bred, Society's silver medal and £10, G. A. Jackson, Bradford. Brood mare for agricultural purposes, being in foal, or having produced a foal in 1865, £5, J. Campbell, Hollins, Padiham. Mare for breeding hunters, being in foal, or having produced a foal in 1865, £5, Mr. F. Steiner, Hyndburn, Accrington. Brood mare for harness purposes, being in foal, or having produced a foal in 1865, £5, J. Peel, Knowlmore Manor, Clitheroe. Pair of horses employed solely in agricultural pursuits, above three years old, £5, R. Eastwood, Thorneyholme, Clitheroe. Pair of draught horses, above three years old, £5, J. Green, Preston. Three-year-old gelding or filly for agricultural purposes, £3, T.

Cooper, Stoneyhurst, Whalley. Three-year-old gelding or filly for hunting purposes, £3, J. Peel. Three-year-old gelding or filly for harness purposes, £3, C. J. Stonor, Chorley. Two-year-old gelding or filly for agricultural purposes, £2, T. Cooper. Two-year-old gelding or filly for hunting purposes, £2, J. Peel. Two-year-old gelding or filly for harness purposes, £2, S. Longworth, Whalley. Yearling colt or filly for agricultural purposes, £2, T. Cooper. Yearling colt or filly for hunting purposes, £2, A. W. Eastwood, Brindle Lodge. Yearling colt or filly for harness purposes, £2, A. W. Eastwood. Colt or filly foal for agricultural purposes, £2, J. Openshaw, Hothersall Hall, Bury. Colt or filly foal for hunting purposes, £2, T. Statter, Stand Hall, Whitefield, Manchester. Colt or filly foal for harness purposes, £2, R. Walker, Thistleton, Kirkham. Hunter, four years old and upwards, and to leap, at the discretion of the judges, three flights of hurdles 4 ft. 6 in. high, £10, G. M'Culloch, Ellesmere House, Pemberton, Wigan. Cob, above 13 and not exceeding 14½ hands high, £3, Dr. Hartley, Fern House, Accrington. Pony, not exceeding 13 hands high, £2, W. Hesket, jun., Accrington. Cup, value 20 guineas, for the best thorough-bred stallion, J. M. Granger. Cup, value 20 guineas, for the best stallion for agricultural purposes, J. Wallwork. Cup, value 10 guineas, for the best brood mare for hunting purposes, F. Steiner. Cup, value 10 guineas, for the best brood mare for agricultural purposes, J. Campbell, Padiham.

**SHEEP.**—Shearling Leicester, £3; J. Simpson, Spofforth Park, Wetherby. Rams of the Leicester breed, of any other age, £2; J. Simpson. Ram of the Southdown breed, of any other age, £3, T. Statter, Strand, Whitefield, Bury. Shearling ram of the Shropshire Down breed, £3, D. R. Davies, Mere Old Hall, Knutsford, Cheshire. Ram of the Shropshire Down breed of any other age, £3, D. R. Davies. Shearling ram of the Lonk breed, £3, J. Peel. Ram of the Lonk breed of any other age, £2, J. Peel. Ram of any other breed adapted to a mountain district, £2, G. Browne, Troutbeck, Windermere. Pen of five Lonk ram lambs, £2, R. Westall, Lower Moor, Accrington. Pen of five Leicester ewes, each having reared a lamb in 1865, £2, G. Browne. Pen of five shearling Leicester ewes, £2, J. Woodhouse, Scale Hall, Skerton. Pen of five Shropshire Down ewes, each having reared a lamb in 1865, £2, D. R. Davies. Pen of five shearling Shropshire Down ewes, £2, D. R. Davies. Pen of five Lonk ewes, each having reared a lamb in 1865, £2, J. Peel. Pen of five shearling Lonk ewes, £2, J. Peel. Pen of five ewes of any other breed, each having reared a lamb in 1865, and best adapted to a mountain district, £2, G. Browne. Pen of five Lonk gimmer lambs, £1, T. Birtwistle, Oak Tree Inn, Accrington. Lonk ram lamb, £1, J. Peel.

**PIGS.**—Boar of the large breed of any age, £3, B. Dickinson, Old Road, Stookport. Boar of the small breed of any age, £3, R. Dickinson. Breeding sow of the large breed, in pig or milk, £2, W. Gaman, The Green, Thornton-le-Moors, Chester. Breeding sow of the small breed, in pig or milk, £3, D. Henderson, Accrington.

**ROOTS AND SEEDS.**—Collection of roots and vegetables, not less than six distinct varieties, £1, J. Smith, Whittle Woods, Chorley. Six roots of swedish turnips, 10s., E. Turner, Hopwood, Heywood. Six roots of any other kind of turnips, 10s., R. Thompson, Mythop, Kirkham. Six roots of long red mangel wurzel, 10s., T. Lazenby, Leyland, Preston. Six Scotch cabbages, 10s., J. Smith. Twenty potatoes of any kind, 10s., R. Thompson. Sample of round seedling potatoes, £1, T. Crook, Leyland Lane, Preston. Sample of kidney seedling potatoes, £1, T. Crook. Twelve carrots of any variety, 10s., B. Dunderdale, Nately, Garstang.

**BUTTER AND CHEESE.**—Basket of butter, not less than 10lb., £2, G. Haworth, Lower Darwen. Dairy of cheese, consisting of not less than 1 cwt., £3, J. and J. Porter, Hodder Bank, Whitewell.

## THE DUKE OF ARGYLL ON HIGHLAND AGRICULTURE.

At the banquet which attended the proceedings of the Highland and Agricultural Society's show at Inverness, the Duke of Argyll, president of the society, in proposing "Prosperity to the Great Highland and Agricultural Society of Scotland," said: In going over the showyard to-day I could not help contrasting the picture which the show presented to me, in the improvement which has taken place in the Highland counties of Scotland, with another picture which I have recently seen drawn in London with reference to the condition of these counties. Gentlemen, about six weeks ago, towards the end of the month of June, I received a very civil note from a gentleman who may be well known by name to some of you—a gentleman of great eminence connected with the social and economic sciences of London, a foreigner and a Jew by birth—Professor L. Levi, a very distinguished man, who wrote to me that he was about to read a paper upon the agricultural and social condition of the Highlands of Scotland before a statistical society of London, and asking me if I would come to hear the paper. Now, gentlemen, I was very anxious to do so, because I confess that I have a very strong impression of—I will not call it ignorance, because that will be considered an offensive term, but of the want of information respecting the real condition of the Highlands, which exists among many of our friends in the south of England, especially among literary men, and which often, I am afraid, is prevalent in the southern districts of Scotland. I went; and I must say that what I heard in respect to the peculiar absence of information to which I have alluded exceeded my most sanguine expectation. I do not know, gentlemen, whether you will be surprised—I think you will—when I inform you that the thesis or assertion with which this paper started was, that the Highland counties of Scotland were stagnant, and in some cases in a declining state; and the paper professed to account for this terrible phenomenon, that whilst the whole of England and all the southern counties of Scotland, and many even of the counties upon the eastern border, were in a most thriving and prosperous condition, it was undoubtedly a most melancholy fact that the Highland counties of Scotland were in a stagnant, and even in a declining state. Well, gentlemen, you will perhaps desire to know what were the facts upon which this learned gentleman—a gentleman of very great distinction in literary circles in London—professed to found this picture of the condition of the Highlands of Scotland. He had elaborate statistics, which were painted on large boards or canvases, and the main facts to be brought out were these: First of all, then, there was a very small population in proportion to the acreage, as compared with the low countries—certainly a fact not very startling to those who have, as I have done, gone along the great north road, and observed the nature of the country through which this line of railway passes. The second was the proportion of rent to the acres, and I apprehend that farmers in this part of the country would be very sorry to have to pay as much as their more fortunate brethren in the south for the acres they cultivate. The third table represents the proportion of acres in tillage as compared with the acreage in pasture, and I need hardly say that in this respect he pointed out a most terrible discrepancy between the northern and the southern counties. But, gentlemen, the most damning of all remains to be told, namely, that if you walk through the mountains of the Highland counties, you possibly would meet with seven, or even, in some counties, ten sheep for one man. That was the fact that was the clincher to the argument, as showing the melancholy condition of the Highlands. Now it was a very curious thing that there was no table to represent the physical geography of the country—how many of these acres were barren rock, how many were bog, how many were uncultivated and on an angle of 45 deg. to 60 deg., how many occupied the tops of mountains. But no reference whatever was made to the physical geography of this country, without which, I need hardly tell you, the elaborate figures were moonshine, and led to no practical conclusion. I wish to say a word seriously with regard to the impression that prevails in many minds in the south; because I must say that

it is a remarkable fact that in a learned society in the middle of London, containing many eminent men who are acquainted, or who ought to be acquainted, with the condition of Scotland—and my hon. friend Colonel Sykes, the member for Aberdeen, in the chair—such a paper should have been read, showing such remarkable absence of information. Nevertheless, I believe it to be a widespread idea that the condition of the Highland counties is in many respects decreasing as compared with the condition of the country perhaps 120 or 150 years ago. I need not tell you how erroneous this impression is, but I think it worth while to enter into some of the causes of this idea being so generally entertained by our brethren in the south. If I were asked the main causes, I am not sure that I should not allude first and foremost to the influence exercised by the writings of our immortal countryman, Sir Walter Scott. Seizing, as it was his part and duty to do as a great novelist—seizing on those characteristics of the ancient condition of society in this country that were capable of poetical and picturesque treatment, he did treat of these in a manner such as no other man could have treated them—lighting them up with the splendours of his own unrivalled eloquence and genius. The consequence has been the passing over in silence the more melancholy facts in respect to the ancient condition of the Highlander—the consequence has been, I repeat, the general impression now prevailing, that though in ancient times we were terrible and formidable to our friends in the south, yet among ourselves our population at home lived securely and in plenty—living upon the moor fowl and upon the roe and upon the deer, always in abundance, with milk from their cows, and cheese from that milk—the people, in short, though living in a primitive state, were yet in a happy and prosperous condition. Also, when we come to look into the real facts as to the condition of the Highlands before the closing of the great civil wars that were concluded on the Moor of Culloden, that lies close to where I now have the honour of speaking—when we look into these facts we shall find a very different picture. I do not know that many of you may have happened to see a very interesting work, published recently by Professor Cosmo Innes—a thorough antiquary—who describes the condition of the Highlander in the 17th century in these words: "We know, from authentic sources of information, that, in counties where sheep were kept, they were in miserably small flocks, herded close to the dwellings of the owner. Black cattle, in like manner, were few and bad. It could not be otherwise. The mountains swarmed with foxes and wolves, and other coveteers more daring and skilful. Every clan was against its neighbour. The country was covered with marauders, to whom everything was lawful booty—that being preferred which could be moved off on its own legs. Even deer were scarce, arising from the state of the inhabitants of the Highlands, always on the verge of famine, and every few years suffering the horrors of actual starvation." Now, gentlemen, this is the picture drawn by Mr. Cosmo Innes, a man thoroughly acquainted with all the old documents which reflect the domestic manners and habits of Scotland during the 17th, 18th, and 15th centuries. There is another cause which has led to the prevalence of the impression to which I have referred, and that is the common notion, which was evidently the notion of Dr. Leone Levi, that the introduction of sheep farming into the Highlands was not an addition to the ancient culture, but was entirely in substitution of it. Now, I believe this to be a very general mistake. The truth is that, before sheep farming was introduced into the Highlands, the pasture of the higher mountains was wholly lost to the use of the farmer, and the low grounds gave food to a few black cattle, while the lower slopes of the mountains during the three months of summer were used for the making of butter and cheese in those little shealings which all of us have seen in our walks on the moors. But the pasture on the higher mountains was absolutely lost. No animal except the wild deer pastured there. It was entirely lost as far as regards the production of food for the human race. The introduction, therefore, of sheep farming, which took place exactly



100 years ago—for I believe 1764 was the first year they saw this system introduced into the Highlands—was as really an addition to the food-producing capabilities of the country, as if the tops of the mountains had been for the first time reclaimed from the ocean. I do not mean to say that sheep farming is not, in certain particular districts—in the narrow glens of our West Highlands, where the cottar tenantry maintain a miserable cultivation, living upon very bad oats and very bad bere—I do not mean to say that sheep farming may not have been a substitution in some of those localities; but I mean that sheep farming has been, not a substitution of ancient tillage, but wholly in addition to it; and if you count it acre for acre, you have four or five times the amount of land under tillage now which you had one hundred years ago. And one of the best proofs of this is the extraordinary and almost incredible rise in the value of land which has taken place in the course of the last hundred years. To illustrate this, I may mention a particular case which came under my own knowledge during the last few years. I know one estate, of which I have the complete rent-roll of one hundred years ago, and at the conclusion of the civil war the rental was about £5,000. It is no longer in the hands of one person, but is separated into several hands; and I know that the lands which from 1756 to 1780 represented only between £5,000 and £6,000 a-year, now represent a rental of nearly £70,000. Now, making full allowance for the difference in the value of money, you will at once perceive the sort of increase that must arise from having the new cultivation and the employment of land in entirely new purposes; and I must say that at a time like this, when the working classes are paying 9d. to 10d. a pound for meat, this does seem the strangest accusation to bring against the Highlands, which have used every exertion in their power, by the skill and outlay of capital, to increase the supply of food for the country. A third proof of this misunderstanding is the undoubted fact that, at certain intervals, there have been periods of distress in the Highlands. But I think if you inquire into the fact you will find that the distress has always taken place exactly where the old system has remained unchanged, where we have a very poor cottar peasantry without capital and without skill, living on potatoes and the produce of their little crops, and who, being exposed to the vicissitudes to which our climate is particularly exposed, have felt the pressure of famine, which has, in all circumstances, been a great affliction to the Highlands. Before passing on to another subject, you will allow me to say a few words with regard to the other tenantry. I believe some of the most successful instances of the crofter tenantry are to be found in the immediate neighbourhood of this city. I am told, for example, that they are very thriving and successful in the district called the Black Isle, which, although it no doubt at one time deserved its appellation, ought now more properly to be called Yellow Isle, from the beautiful crops with which it is covered. But I believe the small crofter tenantry will only be able to maintain their places where they are enabled to eke out their subsistence by daily labour; and I believe that in cases of success it has been in consequence of their nearness to towns like this. But in the western district of the Highlands, where access to labour is more difficult, I believe the small cottar tenantry will be naturally replaced by a much larger class of farmers; and I do not believe this will be much loss to the country, but, on the contrary, as regards the produce of food for the use of man, that the change will be one more for the better than for the worse. I do not say this, gentlemen, without full appreciation of the merits of the small tenantry; but it appears to me that, after all, there is a very great mistake in the law of the country as to the tenure of land in the Highlands. The tenant-farmers of Scotland may rightly be divided into three great classes. At the lower end of the scale you have the small crofters to which I have referred, and at the other end of the scale you have the great capitalists of Berwick and the Lothians, represented in the Highlands by the larger and more extensive grazings. But between these two extremes there is a large class who are not embraced in them—the great bulk of the tenantry of Scotland, what I may call the middle-class tenantry—men paying between £100 and £500 a-year. Now, although I believe it to be true that the small cottar population of the Highlands is decreasing, I do not believe that this middle class is decreasing, but, on the contrary, is increasing. I myself have had some personal experience of

all these classes of tenantry, and I know very well the immense advantage which it sometimes is to men who own land, and possessing great resources of their own. I know the owners in such circumstances find their rents very secure, and that there is very little trouble for the outlay of capital. I must say this, that tenants lay out great capital themselves without asking their landlords' assistance. I must say, passing from Berwickshire and the Lothians, that I never can cease to admire the magnificent crops there exhibited; and notwithstanding my own preference, perhaps arising from early associations and from the appearance of the country with which I am most familiar, and where I chiefly live—I confess that I do prefer the landscape which is most thickly covered with happy industrious homes. I should be ungrateful to a class of men to whom, I believe, the landowners of Scotland are under very deep obligation, if I did not say that I believed a great deal of the improvement of the land in Scotland has taken place under the care of men who are not great capitalists, who have seldom more capital than just enough to stock the farm, and have beyond that to depend upon their own labour, and that of their sons and daughters. I should indeed deeply regret any change, from whatever cause it might come, which would tend to depreciate or disparage the middle-class tenantry in Scotland, or which would tend to substitute for them men of great capital like the capitalists of the Lothians, or the great sheep-farmers of the Highlands. I hope the great class of tenantry will continue to thrive and prosper, and that it will be the object of the landlords of Scotland to preserve them. Now, having said so much with reference to the inferences that have been erroneously drawn from false statistics, allow me to pass to another subject, to which I referred when first I had the honour of presiding over this Society, and which I must be again allowed to refer to, as it is the last time I shall have the honour to address you in the capacity of your president; and that is the importance of having real, genuine statistics to oppose to those imperfect, and, it may be, false statistics, which are culled from accidental sources of information by such eminent men as Prof. Leone Levi. I don't think that the errors into which that gentleman fell were due to the fact that he relied on statistics: on the contrary, the errors into which he and others fell are due to the fact that we have no reliable statistics of agriculture in this country. It is a disgrace to us that we should have to make such a confession at this time of day. I do not say this deprecatory of the Highland Society; because, so far as the Highland Society is concerned, mainly through the exertions that have been made by our distinguished secretary, Mr. Hall Maxwell, we have attempted to get something like a system of agricultural statistics for Scotland; but from various causes, to which I need not refer, the attempt broke down. The only part of the United Kingdom which is now able to present a complete and satisfactory statement of its agricultural produce is the sister-kingdom of Ireland. I have now to inform you that it is the intention of Her Majesty's Government to endeavour to get England and Scotland to provide a complete system of agricultural statistics. The difficulty hitherto standing in the way is that we have not had in England and Scotland the same complete machinery as in Ireland. I therefore make an earnest appeal to the tenant-farmers, who are intelligent enough to know the importance of knowledge in all its forms, to second the exertions of the Government to enable them satisfactorily to say what are the number of acres under each crop in the United Kingdom, and to give all such information. Were this done, and had we a good system of agricultural statistics, we should be able more effectually to refute the erroneous statements made by Professor Levi in his paper. Before passing from this subject, will you allow me to mention that at the end of Professor Levi's lecture I ventured to make some statements to the Statistical Society of London, which were very favourably received, and they asked me to prepare a paper on the state of the Highlands for the last 100 years—to be read at the next meeting. I should be very glad if any gentleman connected with the Highland counties would supply me with any information as to the traditions of his own neighbourhood or with facts coming under his own knowledge in regard to the people in his own district or county, as to the quantity reclaimed within a given period, and the condition of people now as compared with their condition sixty or one hundred years ago.



## EARL GREY ON NORTHUMBERLAND FARMING.

At the Northumberland Agricultural Society, Earl Grey, who occupied the chair, in proposing "The Northumberland Agricultural Society," said he saw around him in that place clear evidence that the society was well supported by those who were interested in the cultivation of the land of Northumberland. And he was told by those who were far better judges than himself that in the show-yard there was also abundant evidence, in the excellence of the stock and the number of the implements, of the progress which agriculture was making in the county. He was assured that the exhibition of stock did the highest credit to the breeders of Northumberland; and the fact that so many and such valuable implements were shown was, he thought, unmistakable proof of the progress which was making in improved farming, because, of course, those implements were not brought there unless the makers expected to find a demand for them among the farmers. They had, therefore, he thought, clear proof that agriculture was advancing in the county; and he believed that to that advance the Northumberland Society had in no small degree contributed. For many years they had been annually bringing together the owners and occupiers of land to enable them to see each other's breed of stock, and thus a very great impulse was given to the farming of the country. It was to those that, at least in a great measure, they might attribute the progress which had been made. As to the fact of the progress, he thought that no doubt could be entertained by any who, like himself, were old enough to remember what the state of things was twenty-five or thirty years ago. The change in that time seemed to him, in looking back, almost marvellous. They remembered that at that time attempts which had been made to improve farming were few and feeble. Now, on the contrary, scientific farming was almost universal throughout the county. The sums which had been spent on drainage in Northumberland in the last 25 years alone might, he believed, be written not by thousands of pounds, but by hundreds of thousands. They also saw similar improvements in farm buildings, especially in the most important of farm buildings—he meant the cottages of the farm labourers. He could remember the time when the dialmal Northumberland farm cottage was almost a by-word in the kingdom; and to a great extent he thought they deserved the reproach—they had incurred it by the state of their cottages. But he was happy to believe that at the present moment there was no county in England in which more had been done in a limited time to improve the dwellings of the labouring class than in the county to which he was proud to belong. Within the same time they had also seen a wonderful change in the process of cultivation. Up to a certain number of years ago everything seemed to have got into a state of stagnation. People merely followed the beaten track of their forefathers, and there was scarcely known an attempt on the part of farmers to depart from time-honoured practices of former days. But they had latterly awoke from their trance. Extraordinary efforts had been made; and they now saw in every department of farming a wonderful change. The implements which they now know were no longer the old-fashioned ones of their forefathers; and there was no county in England where a larger proportion both of their grass crops and of their corn crops was got by machinery instead of by hand than in Northumberland. That had all been done in a few years; and he was informed a few days ago by a tenant of his own that the cost of harvesting the crops now—a-days by machinery was less by one-half. That was all improvement. And in the same manner the increase of stock and the improved modes of managing it—the improved modes of cultivating—were all testifying to the progress which had been made. No doubt the farmers had a hard task in bringing about the great improvements they had done; but they had proved themselves equal to the task, and the proof of it was that at that moment the price of land in Northumberland was higher than at any former period, and it apparently tended rather to rise than to fall. The difficulties of the farmer had latterly been very great, but perhaps in the last twelve months those

difficulties had been greater than usual, because, if he was not misinformed, the past year had been one of pressure and heavy trial to a large proportion of the county. If he was not mistaken, they had most of them found that the corn crop of last year was a very disappointing one, probably owing to the severe winds which prevailed at the critical season, and thus the crops had not come up to what was expected; and while the greater part of England had an unusually bountiful harvest, in Northumberland, on the contrary, the farmers had in general less than they calculated upon. That fact had been a heavy trial to the farmers of Northumberland; but it had been met in a great deal no doubt by the high prices they had received for their stock. That seemed to him to mark a sign of the reduction in the price of corn to which they would have to look forward in the future, because he did not think, if they looked to the future price of that commodity, they could look for any high price for corn in this country. Agriculture was extending and improving all over the world: the facilities of transporting corn were also increasing. Foreign countries were adopting railways, and even those countries which had been most behindhand and the exception were now adopting the railway. Thus those increased facilities were rendering the transport of corn to our shores from foreign countries more easy, and our population were enjoying the inestimable benefits of that cheap food which conduces so much to the general prosperity, and it was not likely we should return to the old prices. With respect to the growth of wool, the improved welfare of the population, their increasing numbers, as well as the increasing daily comforts of the people, would promote the demand for woollen clothes. On the whole, he thought that, with respect to farmer's stock and the growth of wool, they might look for a continued high price for some time to come. And that appeared to point out to them the direction in which their efforts should mainly be made in endeavouring to meet the difficulties which surrounded them as farmers. He was persuaded that the old-fashioned system of trusting to a weak crop for fallow was gone for ever. As to the increasing of the corn crop, he could tell them that it must be done in combination with an increase in the production of stock, and though there were great difficulties to be encountered—especially in certain districts of the county—in increasing the proportion of stock, from the nature of the soil on some of the heavier lands near the coast, he did not consider the matter a great difficulty. Still, he was persuaded that if they set themselves resolutely to the task they would be able to accomplish it. He looked to their deriving great assistance in that respect from the recent invention of the steam plough. He knew that some of those who had already tried that implement had been quite astonished with its benefits, and they believed that in a few years people would see the flat and heavy lands of this country largely cultivated by the steam plough, and they would by that means be enabled to raise a larger proportion of produce than was now done. He also recommended a greater growth of root crops, though it was almost in vain to grow such crops unless they could have them often. Much, however, might be done in that respect by the use of portable rails or tramways, which in some parts of England was carried out to a great extent, and which did very much in preventing land from being injured in getting away the crops. He believed that they might do more than they had done by feeding cattle with tares and cut grass, and much might be done by increasing the protection of those lands which in the time of our ancestors were considered the main reliance of the country for the supply of food, but which in our days seemed to have been neglected somewhat. He thought he ought to make some apology for having, as a person who could boast of comparatively little practical knowledge, ventured to address his remarks to persons of whom he had no doubt nine-tenths knew far more about these matters than he did. Still he thought it sometimes happened that those who might not be themselves equal to carrying on any branch of industry practically might yet be observers of what was done by others, and, by watching the circumstances of the time and the prospect of the future,

form a sound opinion in what direction the efforts of practical men should be made. But he thought he was not wrong by directing them in the daily occupations on their farms, and the highest authority on agricultural matters concurred with him in saying that their chief attention at that moment ought to be directed to increasing the number of their stock.

### NORTH-WEST OF IRELAND AGRICULTURAL SOCIETY.

The annual show, in connection with the above society, was held at Derry on August 9th, and proved a decided success. At no previous show of the society was a finer display of cattle made, and competent judges decided that the exhibition in every department was a very choice one, nothing in the shape of inferior stock having been brought forward. The yard was thronged during the day by ladies and gentlemen, among whom were the Marquis of Abercorn, president of the society; Lord Viscount Hamilton, M.P. for Donegal; Lord Claud Hamilton, M.P. for Tyrone; and Lord Claud John Hamilton, M.P. for Derry City. The acting judges were Messrs. Seymour Mowbray, Charles L. Ellison, and David Hastings; and the following is their award:—

#### SHORTHORNS.

For the best Bull calved previous to January, 1863: First prize, £8, George V. Hart, Esq., Kilderry, Maff; second, £4, George Cather, Esq., Carrichue, Derry; third, James Sinclair, Esq., Dromore, Coleraine.

For the best Bull calved in 1863: First prize, £8, Major Hamilton, Brown Hall, Ballingtra; second, £4, Captain Perry McClintock, Seskanore.

For the best Bull calved in 1864: First prize, £8, J. G. Grove (Wood), Esq., Castle Grove, Strabane; second, £4, J. H. Brooke, Esq., Brookhill, Derry.

For the best Cow calved previous to January, 1862, in-calf, or having had a calf in 1865: First prize, £5, and second, £3, J. G. Grove (Wood), Esq.

For the best Cow calved in 1862, in-calf, or having had a calf in 1865: First prize, £5, J. G. Grove (Wood), Esq.; second, £3, Samuel Smyth, Esq., The Cross, Derry.

For the best Heifer calved in 1863: First prize, £5, and second, £3, J. G. Grove (Wood), Esq.

For the best Heifer calved in 1864: First prize, £5, J. H. Brooke, Esq.; second, £3, N. M. Archdall, Esq., Crocknagrive, Enniskillen.

#### AYRSHIRE CATTLE.

For the best Bull: First prize, £5, Mr. William Donnell, Ballinamallard, Strabane; second, £3, Robert L. Moore, Esq., Molenan, Derry.

For the best Cow, calved previous to January, 1862, in-calf, or having had a calf in 1865: First prize, £3, Robert L. Moore, Esq.; second, £3, Mr. John M'Ivor, Grange, Strabane.

For the best Cow, calved in 1862, in-calf, or having had a calf in 1865: First prize, £3, Mr. Gavin Craig, Oughtymoyle, Magilligan.

For the best Heifer, calved in 1863: First prize, £3, Mr. Gavin Craig; second, £1, Wm. Knox, Esq., Clonleigh, Strabane.

For the best Heifer, calved in 1864: First prize, £3, and second, £1, Mr. William Donnell.

#### CATTLE OF ANY DISTINCT BREED OTHER THAN SHORT-HORNED OR AYRSHIRE.

For the best Bull, £5, Samuel Gilliland, Esq., Brookhall, Derry.

For the best Cow, calved previous to January, 1862, in-calf, or having had a calf in 1865: First prize, £2, and second, £1, Samuel Gilliland, Esq.

For the best Cow, calved in 1862, in-calf, or having had a calf in 1865: First prize, £3, and second, £1, Samuel Gilliland, Esq.

For the best Heifer, calved in 1863: First prize, £3, and second, £1, Samuel Gilliland, Esq.

For the best Cow in-calf, or giving milk (extra prize): First prize, £3, Mr. James Crawford, Rosnagallagh, Waterside; second, £1, Mr. John M'Ivor, Grange, Strabane.

#### SHEEP.

For the best pure Shearling Ram of any breed: First prize, £5, and second, £3, H. L. Prentice, Esq., Caledon.

### COUNTY OF CORK AGRICULTURAL SHOW.

On the 2nd of August, the County Cork Agricultural Society held their annual show on the premises of the Corn Exchange. The show was not so numerously filled up in its several sections as on former occasions; but the general stock of short-horns and sheep were very select, if we except that for aged bulls. In this section there were six entries. The leading animal was Amer, the property of Mr. Henry Barry, Ballyadam, Carrigrohilly, bred by the late Mr. Coppinger. He was seconded by Mr. Downing's Earl Windsor, which was first in 1864. In the two-year-old bulls there were three entries, Major Wallis, Drishane Castle, taking the first place with Felix, from Mr. Jones of Mullinabro's herd. In the section for yearling bulls there were four entries, Mr. Anderson, Grace Dieu, taking the first place, and Meade and Garde challenge Cup, for Mercury, bred by himself. He was seconded by Sir George Colthurst's Navigator, bred by Mr. Barnes, Westland. The bull calves were very excellent, and contained eleven entries, the first and second honours going to Mr. Welsted, Ballywalter, the prize for the best bull bred in the county, and the Meade and Garde Challenge Cup for Winter King and King Oberon respectively, both got by Elfin King.

In aged cows there were five entries, Mr. Jones, of Mullinabro, heading the lot with his Lady Spencer, which was the prize cow at the last spring meeting of the Royal Dublin Society.

In two-year-old heifers there were but two entries, Mr. W. H. Massey standing first with Wood Belle, bred by the late Capt. Ball. The second was Molly, belonging to and bred by Timothy Hallanan, Currane.

In the section for yearling heifers there were five entries, Mr. Welsted taking the lead with Rosette, the prize for the heifer bred in the county, and the Meade and Garde Challenge Cup; got by Elfin King out of Rosa by Crusade. She was seconded by Mr. Jones's heifer Lunette, by Master Harbinger out of Luna, by First Fruits.

In horses the numbers were much less than usual; the £50 Challenge Cup for the best thorough-bred sire for getting weight-carrying hunters was awarded to Mr. F. H. Power, Rosken, Mallow, for Mount Zion. In agricultural horses there was nothing deserving of particular notice.

In the show of Leicester sheep Mr. W. R. Meade took first for a shearing ram, bred by himself; the Representatives of J. H. Smith Barry stood second for a Plymouth commended shearing; Mr. Meade taking both prizes for the first and second best county bred.

In the section for aged rams the Representatives of the late Mountfort Longfield took the lead, and the Garde challenge cup, and the first prize for the best ram of any other age bred in the county; Mr. Meade standing second, and taking also the second prize for the best aged ram bred in the county.

In the section for the best pen of five shearing ewes Mr. David Hewetson stood first, and the Representatives of Mountfort Longfield second, and also the prize for the best five shearing ewes bred in the county.

In shearing Shropshire Down Rams the Representatives of J. H. Smith Barry took both first and second prizes.

The judges were—In short-horns, L. Christy, A. Warburton, and J. M. Royle, Esqrs.; and in sheep, Seymour Mowbray, A. Warburton, and J. M. Royle, Esqrs.

#### THE IMPLEMENT STANDS AT PLYMOUTH.—

Our report rather strangely omitted to make mention of several firms famous for agricultural carts and other vehicles. Beyond the great Beverley Company, Hayes of Stamford got up a good stand of waggons and single-horse carts, with which, as the return will show, he took a number of prizes. There were also some exceedingly well-made and nicely-fitted carts, and a wagon that tips its load sideways, on the stand of Messrs. Thomas Milford and Son, of Thorverton, Devon. George Milford, of the same place; F. P. Milford, of Kenn, near Exeter; Fry, of Bristol; and Ball and Son, of Rothwell, also exhibited very well-designed, well-built, sound, good harvest carts, marked at very moderate figures. Among the novelties were the feeding-troughs of A. E. Peire, of Hammer-smith, made of wrought-iron and japanned—probably the best things out for durability and cleanliness, and sold at a low price.

## OUR FRIENDS—THE BIRDS.

BY A PRACTICAL FARMER.

I was amused by W. W. G.'s humorous notice of Mr. *Punch's* lines on "The Season for Sparrow Clubs." \* \* \* Nevertheless, we must be upon our guard lest we encourage a dangerous increase of these friendly but highly mischievous gentry—the common sparrow. I must confess I am often in doubt whether the usefulness of the sparrow or his mischievous propensities predominate. To look at him just now, I should say he was the most impudent, audacious, destructive little rascal known. There he is, looking at me through my open window, as careless and independent as if the whole world were his own, and not caring to quit his perch although he sees me move close upon him. Then look at my spouts how they are pestered by nests; and my climbing roses, my honeysuckles, and ornamental wires and their trailers, how they are encumbered and marred by the like; and, take them down as often as I may, there they are again—a little hard-working persevering saucy rascal, and he is everywhere present. If I go to my poultry-yard, there he and a fine cluster of his fellows are ready to meet me; and in my very presence there they are, picking up the scattered food from the outskirts; and the moment my back is turned, down they come, regardless of cockerel or clucking hens, and fighting their way for the choicest scraps. In my fruit garden there whole flocks of them are, amongst my currants and raspberries; nor do they disdain to take a pick at most other sorts, my walled plums and pears being very tempting. As to my vegetable garden, why he is a real nuisance, a downright thief: my radish-seed beds, lettuce-seed, onions, carrots, and every other little seed, he will have, unless covered so that it is more trouble than profit to him to get them, and so he is off elsewhere. But this is all as nothing when I follow him to my corn-fields: just look at the headland of the two-and-twenty acres, all the length where the hedge is left to grow for draining wood, why he and his clan have eaten or "champelled" out the whole. You little rascals off, with you! "Boy, why don't you keep them off?" "Can't, sir; they fly to the other end and on again." "Do you shout?" "Yes, sir; but they don't care, they just fly up." "Are they making like mischief in the forty acres?" "Yes, sir; I can't frighten them away." "Well, we must poison them; we can't suffer all this damage." "And, sir, they have begun of the mangold wurzel seed, and some of them are helping the birds on the turnip-seed, but not many; it's the linnets; but they are on the tares, and the cole-seed, and some are on the light headland of oats, and some where the barley is down; but the wheat is the worst; there are thousands on the wheats, I can't keep half of them off, and I am shouting at them at 4 o'clock in the morning and all day, sir." "Well, my boy, you give a sad account of them. We must get rid of them in some way, that's certain; we can't go on so." Well, I leave the boy, and walk on to the thirteen acres adjoining the sadly-injured headland. What a beautiful crop of mangolds. Why there is not a bare place to be seen. How is this? Last year all my crops were eaten by grub or wireworm, and now how thriving they look! I pass on to the thirty-one acres. What a capital plant of swedes! full everywhere. Last year the grub and wireworm took nearly the whole. This year I have the best plant I have had for many years, and last year it was the worst. I wonder whether the birds have had anything to do with it! I told the

boy we would be rid of the sparrows; but really "I must think twice." I don't think they are any great catch at caterpillars, or they would have cleared my currant bushes long ago; but they are right good hands at little grubs—i. e., wireworms, tom-tailor grubs, and the like; but, best of all, see them on a fine summer day chasing and chasing and chasing butterflies, tom-tailors, beetles, cock-chafers, moths, flies, and innumerable insects in every variety. And then, again, notice them picking up ants, worms, and every little creeping thing, and again see them amongst the aphides, bugs, spiders, fleas, ticks, gnats, beetles, earwigs, and the thousands of flying insects to be found everywhere. I see these busy little birds are less for the larvae of these insects than the insects themselves: hence their indomitable perseverance and activity. Well, after all, what am I to do? Last year my crops were destroyed by grub, wireworm, and aphides; for I lost 22 acres of beans by aphids. This year all is at present safe. It is true we have a countless number of birds. We have had a fine winter, we have had abundance of food for them, and I know they worked hard both in the field and at every hedge-bottom and tree-root; and we have less grub, less wireworm, less aphides, &c. Now if the winter was favourable for the bird, it would also be better for the grub, or the preservation of the chrysalis, so that we might expect a renewal of attack upon our crops; but this is not the case. How far, then, are we indebted to the friendly aid of the feathered tribe, not forgetting my old friend Mr. Cock Sparrow? In all soberness I must say we must acknowledge our indebtedness. It is mainly to their unceasing inroads upon the retreats of grubs, wireworms, and chrysalides, that our crops are in such an enviable position—that our winter food prospects are so good. I can speak most satisfactorily of a flock of rooks who spent nearly the whole winter upon two fields of mine—one of 24 acres, from which a fine plant of turnips and mangolds were completely eaten off, and the other 22 acres of mangolds and swedes, which were greatly injured. Upon these two fields they were permitted to work as they liked: they burrowed into the light soil to considerable depths, and I believe appropriated to themselves nearly all the grubs and most of the wireworms. The grubs were those of the dart-moth, large and full. On the 24 acres there is now growing a splendid crop of potatoes, and on the 22 acres a good crop of oats: for both I am, in a great measure, indebted to the rooks. These rooks in their way are great thieves notwithstanding: they make sad havoc with the newly-sown grain, young potatoes, ripening grain, &c.; but they in return deliver us from some dire pests. I wish they would use more judgment, but they won't: they pull up the wheat-plant to get at the grub; they tear up the grass to get at the tom-tailor grub; they pull-up the fine turnip-plant to get the wireworm, and so forth, and I put them down as greater friends than enemies to us.

The linnet, again, is a great and indefatigable rogue upon our turnip and coleseed crops: he will not quit his depredations upon them, shoot or alarm him as you will; but then he is equally industrious in searching for larvae, and even caterpillars, or skimming after every kind of flying insect, from the great dragon-fly to the tiniest beetle. The lark, again, does much harm to the early-sown grain on light soils, but he is ever busy after beetle

and bug-aphis, and caterpillar too, besides his daily exploits in capturing these said insect progenitors in their airy flights. The bullfinch is the worst of the feathered rogues for the buds of our gooseberry, cherry, plum, and other similar fruit-bearing trees, as also our flowering shrubs: he is so notorious as to be named "pick-a-bud" in some districts, but he delights in the insect tribe. The hedge-sparrow, almost harmless, though now and then guilty of trespass, is for the most part supported by insect food. The willow-wren is more addicted to prey upon the tempting young buds of spring, but otherwise its food is all from insect life. The robin is, next to the sparrow, the boldest of our little feathered tribe: its chief food is grubs, worms, caterpillars, and the flying insects. The chaffinch is a great destroyer of our spring flowers, our young turnips, and radishes; but as soon as other food of insect or grub life appears, they are happy in searching after it. The tom-tit is another enemy to our early buds, but he amply compensates for these little thefts by the persevering way in which he draws out the chrysalides from nail-holes and crevices, the secreted spider, and the many hidden inanimate forms of insect life. The titmouse—"long-tailed tom-tit": its food is entirely of the insect tribe, in which pursuit he is most indefatigable, as it is amongst the smallest of the tribe he luxuriates. The blackbird and the thrush have a most unmistakable taste for our cherries and plums; but how often are they seen in full pursuit of the finer specimens of butterfly and moth! and woe to the worm on the lawn should a blackbird come in sight, and snails are not safe before them. The magpie, although so roguish, and so desirous to feed upon a young duckling or stray chicken, is the very best fellow we have for searching out grubs and slugs in our pasture-fields; they even turn over the dried dung of animals, and spread it over the surface, to the benefit of

many a slovenly grazier. The jay, when its progeny requires food, will rob our gardens indiscriminately; but for the remainder of the year they confine their attacks to woodlands and thickets, to seeds, worms, and grubs, acorns and crabs, &c. The wryneck, the nightingale, the swallow, the martin, the redstart, the fieldfare, the starling, the lapwing are, more or less, birds of passage, or locating occasionally in one district and then another. Their food is almost entirely the produce of our woods, copses, and hedge-rows for the one part, and of the fly, insect, and grub tribe on the other, and immense quantities of all these tribes do they consume. Verily we are greatly indebted to the feathered tribes for much of our prosperity, as farmers, although we occasionally suffer damage. My private opinion is this: I think God so orders and ordains all things for the good of His creatures that we may safely and securely leave all to His guidance. His stormy winds or winter's blasts would soon relieve us from any excess of danger from His minor creatures. All, I doubt not, is wisely ordained, and it is only for us to make use of those salutary and customary devices for our daily protection as we usually adopt. I cannot think it altogether or perfectly justifiable to destroy any of God's creatures for the mere sake of getting rid of them. There must be some justifiable cause, or it should not be done. Hence I am an advocate for frightening away from our crops these feathered rogues, rather than destroying them; and I think I have shown that the balance between the injury they do and the good they achieve is much, if not altogether, in their favour. It will at all times be found that the cause of their congregating in great numbers upon one particular place or crop is that this particular crop is in advance of all others; but as soon as these come up to the same advancement, then they disperse. They must be kept aloof during this interregnum.

## VALUATION BY ARBITRATION.

TO THE FARMERS OF CORNWALL GENERALLY, AND INCIDENTALLY TO ALL OTHERS.

GENTLEMEN,—The time is near at hand, viz., Michaelmas, when many changes of occupation annually take place, and it is a common practice to take crops, and sometimes stock and implements, by valuation. For many years past I have considered the usual system adopted in arbitration to be very absurd. I believe I may say that there are three separate systems in practice. First, the buyer and seller each chooses a valuer, and these two select a third, whose decision, in all cases of dispute, is to be absolute. If the two first chosen cannot agree on any particular valuation, the third man is called in by them. He is told the opinion of each. He then says what he thinks ought to be done, and his decision is final, if he is farther from the truth than either of the others; but the common practice of this *third man* is to *cut the difference in two*. The second system is, the three arbitrators are chosen as before. If the first two cannot agree, the *third man* is called in—told what the two have in dispute; he is then to give his decision, but that must not be above the highest nor under the lowest; and the probability is that he, too, as in the former case, will *cut the difference in two*, or very nearly so; hence the system of *cutting in two* is so well known, that the two first arbitrators find it desirable to *drive a bargain* rather than say really what they mean. The third system is, the three men are chosen as before, and if the first two cannot agree, they call in the third. He is not told what the two think, but passes his own judgment, which is final, though it may be much higher or lower than either of the others, so that in any case of dispute the opinion of one man only out of the three is taken to decide the case.

Now, gentlemen, the inconsistency of such systems of valuation must, I think, be apparent to anyone who reflects at all on the subject. The first two are fraught with the greatest

temptation to dishonesty; while the last takes all the power out of the hands of the two first, and gives it all to one, which cannot be what was originally intended by choosing three men.

I will just give a practical illustration or two which has come under my own notice. First, two arbitrators are called in to value stock, implements, and furniture. They agree till they come to the last piece of furniture, on which there is a difference of opinion of 15s. as to the value of the article. Neither will give way. They send a distance of four miles for the *third man*: he comes—asks what there is between them—is told 15s.; his reply is, "*Cut it in two*," for which act they have to pay him the usual guinea fee. A second case occurred last year. The first two umpires go into a field of barley. The seller's umpire says there are 75 bushels per acre; the buyer's umpire says there are not more than 42. Each is firm at what he says. The *third man* is called in, and he says 60, which is probably near the truth, but, as usual, is nearly *cutting it in two*. Such cases as these are common in valuation by arbitration. The case, however, is much worse when one umpire is reasonable, but the other unreasonable. Say John Jiles is a mean, inconsistent man, and values for the seller. Henry Stiles is a reasonable, honest man, and is the valuer for the buyer. John Jiles invariably sets down six or nine bushels of corn per acre more than he really thinks are in the field; or, if he be for the seller, sets that less than he believes the crop to be. Henry Stiles cannot be so dishonest, but says nearly what he believes and knows to be correct. They cannot agree. The *third man* is called in, and he, as usual, *cuts the difference in two*, or nearly so, biased, to some extent, as he cannot help being, by the two opinions he has heard. In such cases much loss is sustained by the person whose valuer is a fair honest man. In the third system, where

the third man is not told what the two think, a case occurred thus: Two valuers cannot agree on the value of a hay stack. The third man is called in, is not told what the two think, sets his value, which is higher than either of the others, and is perhaps the most out of the way of the three, yet his opinion is final.

Now, gentlemen, the course I recommend is plain, pointed, and practicable, viz., choose your men, and they the third man, as before. When the first two cannot agree, call in the third man; say nothing to him as to the dispute; let him put his own judgment; add that to the one nearest him in value, and halve those two for the true value. This would make such

valuations as dishonest John Jiles's useless, or else make him approach as near the truth as he could, and hence be the means of making all dishonest valuers approach to honesty and truth, and make useless the present system of dishonest "banter," and give the opinion of two men out of the three for the decision. If any person can offer a better system, or improve upon this, I shall be glad to see their opinions upon it; but if they cannot, I hope they will do all they can to get this improved system of mine adopted.

I am, gentlemen, yours, &c.,  
Talekiddy, St. Columb,  
July 28, 1865. THOS. ALLANSON.

## IMPROVEMENT OF TIDAL RIVERS.

Much of what was said in a previous article on the reclaiming of land from the ocean by embanking, applies to the deepening, embanking, and reclaiming of land from tidal rivers, with a view to improve their drainage, navigation, and fisheries, as well as the adjacent lands on both banks for agricultural purposes. Our remarks at this time will therefore be chiefly directed to the proper form and inclination of the channel of the river, so that the general question under consideration is one in practical geometry, scientifically speaking, as applied to river improvements.

"Given the difference of altitude between high and low water at the mouth of a river, the length of the tidal channel, and the volume of river water, required the dimensions of the channel and embankments," is a proposition that has sadly puzzled many a promising agricultural student long before now, and in all likelihood it will afford to young tyros the elements of botheration for a long time to come. The ancient historian Herodotus never fell into a greater mistake than when he gave a blind credence to the priests of Egypt, who informed him that geometry was first invented by them; for the changing of the course of the river Nile, and the other river improvements thereby effected by Menes, long before their order of priesthood existed, proves not only a practical acquaintance with applied geometry, but also with the experimental solution of our proposition itself; while Noah's Ark, the Tower of Babel, and the irrigation of the plains of Nineveh and Babylon on the Tigris and Euphrates, from whence Menes and his followers came to Egypt, further proves that the antediluvian patriarchs must have taught their offspring the science of geometry as applied to agriculture and the other arts. Both before and after the Noachitic deluge, the whole human race were divided into castes; and, at that time, geometry belonged to the caste that included the agricultural body. Practically speaking, Noah was by profession familiar with geometry. This is manifest from the dimensions of the ark, which involve a knowledge of the geometry both of solids and superficies. It is equally manifest that Noah and his sons taught their offspring, and that geometry was at this early date well understood. The ruins of the great cities and works, which cover the cradle of our race to this day, prove the soundness of the conclusion. They even do more; for they leave it manifest that those at the head of the agricultural body, such as Noah, were better versed in this branch of science than those who occupy a similar position at the present day. No doubt, when mankind began to multiply and congregate in large cities such as Nineveh, geometry was then taught at the gates by aged and learned men, who made this a part of their profession, teaching all who entered in or went out of the city, but more especially the youth of that period. In teaching the elements, diagrams were made upon the ground with a staff—a method which has come down to our own times, and which, although rude as compared with the more refined one of the modern class-room, is nevertheless equally truthful and instructive. Boys are fond of making "circles," "love-knots," &c., and an innumerable variety of figures, with the prongs of a fork or the like—figures generally emanating from the circle—and not a few become proficient also at elliptical and parabolic curves. So far, well. But, unfortunately, their education in this respect stops exactly at the point where it should practically begin, viz., the application of

geometry to useful purposes, such as the solution of our proposition. It was not so in the days of Noah, Shem, Ham, and Japheth, nor in those of Abraham, Isaac, and Jacob; for the Hebrew historian Josephus tells his readers that it was Joseph who first taught the Egyptians geometry; and, although he is wrong in this conclusion, there cannot be a doubt that very many extensive river improvements were effected under the immediate superintendence of Joseph in the great valley of the Nile, and that during the whole time the Hebrews were in Egypt much of their time was occupied in carrying out improvements involving a knowledge of practical geometry—solid and superficial; and, further, that Egyptian tyros, Hebrew and Coptic, had to address themselves both to the scientific and practical solution of our proposition, and so on for all subsequent ages down to our own times.

The above proposition on the form of the channel of a river involves two practical questions—the one in the geometry of solids, and the other in that of superficies; and, as the sloping sides of the channel and also those of the embankments are parabolic-curved surfaces, and not straight-inclined planes, for reasons stated in a former article, it follows that both questions belong to the higher division of the science and practice of geometry. And it may be added that we have purposely made the somewhat lengthy digression contained in the preceding paragraph, in order to show the reader that the application of "Euclid's Elements" to the improvement of our rivers is not a bookworm innovation or new-fangled notion of modern times, but the sterling experimental philosophy, or practice with science, of all ages past and present. That this application of Euclid's Elements of Geometry, as taught by himself, has been sadly neglected in modern times cannot be denied; for it is but too truly verified in the state of our rivers themselves, generally speaking—the physical laws of Nature and the science of geometry harmonising therewith being both sacrificed to a sort of fashionable time-serving expediency as it were, improvements being executed according to a routine-pattern handed down from one generation to another.

The fifth proposition in the first book of Euclid's Elements, for example, viz., "The angles at the base of an isosceles triangle are equal to one another, and, if the equal sides be produced, the angles upon the other side of the base will also be equal," has got the *soubriquet* of "*pons asinorum*." Now what is a big ditch or river, in ordinary cases, but an inverted isosceles triangle? And when we come to examine practically the equal angles at the base, how few practical tyros are there who get across dryshod with flying colours? In other words, how small in number are the farmers who ever applied Euclid's elements of geometry to the superficies of a drain, ditch, river, or embankment? or the geometry of solids to the contents of the same? Although in both cases such is truly the science of the actual practice in question as taught. It follows therefore that if farmers are to learn the science of this branch of their profession, they must become masters of the application of Euclid's Elements to river improvements; and much more than the few books of Euclid's Elements that have come down to our day, and which do not contain the conic sections, are absolutely required, the curve of a parabola being essentially necessary to elucidate and exemplify sound practice. In other words, when spoken in plain English, "*pons asinorum*," although the common rule taught both in agricultural works

and in the actual formation of rivers as an art, is not sound doctrine! Hence the injury which the banks of improperly-formed rivers and ditches sustain from the action of the water, more especially when the flowing current is of considerable depth and breadth, and exposed to high floods, tides, and storms.

Were the course of tidal rivers straight, and the bottom of their channels of uniform inclination, the practical rule would be simple, as in such cases they would increase in breadth towards the mouths as they increased in depth, due provision being made at the same time for the action of waves towards the ocean.

In practice, however, tidal rivers flowing in right lines, and at a uniform inclination and velocity, at low water, are the exception, and not the rule—so much so, that there is probably not a single normal example of the kind to be met with in the United Kingdom, to which the above rule applies to its naturally-formed channel. Where art interferes to control the operations of nature, new channels may be made straight, and the old crooked ones filled up with the newly-excavated materials; or the old channel may be straightened by means of dredging and embanking, and the bottom of the bed of the river may at the same time be reduced to a common and nearly uniform inclination. Several artificial examples of this kind might easily be quoted, were it necessary, where old outfalls have been straightened and new ones made, the old having been filled up, or converted into canals or other purposes of navigation.

When large rivers deposit much mud, forming new land rapidly at their confluence with the ocean, very great care requires to be observed, both in making a new outfall and in straightening the old, by individual landowners occupying only on one side of the river, otherwise they may do an injustice as readily to themselves as to their neighbours. Land, for example, was rapidly being formed on the right bank of a river where it entered an arm of the sea; but, inadvertently, a vessel was allowed to discharge some ballast at a turn or bend where it was presumed by the captain of the vessel that it would help to straighten the river and improve its navigation. But the hypothesis was unfortunate, the very reverse being experienced; for it so happened that during heavy storms, floods, and high tides, the course of the stream gradually changed, the formation of new land taking place at the left or opposite bank of the river, while the navigation of the channel at its mouth became more difficult than previously. Similar effects are produced up the river, the current being liable to be deflected from one side to the other even by the stoppage of tree roots, to deepen the channel unequally, and to cut in upon one side or slope, if not protected, and to deposit gravel and sand, thereby raising sand-banks, much to the injury both of the navigation and drainage. And such results are equally liable to be effected, whether the process of straightening is by deepening the channel where "races" and "fords" have naturally been made, or by narrowing it by embankments where "pools" and broad parts have been formed.

It often occurs, in inland tidal causes may be said to have the natural work of formation originally affords the safest practical rule for the operation of deepening, strengthening, and improving the bed of the river by artificial means. By what law or combination of forces have the river and tide scooped out the channel in which they flow, winding it about so as to increase its length from two to perhaps four times, making it broad and expanding in one place, narrow and deep in another—here having a perceptible inclination, but there a comparatively standing, or rather boiling, "pool" or "pot"?

In this natural work four causes may be said to have operated towards its completion: the first of these is the general inclination of the valley in which the river flows, as the valley of the Thames or of the Forth; the second is a diversity in the quality of soil of which the valley is formed; and the third and fourth involve the action of the flowing and ebbing tide, and that of the gravitation of the river, together with the action of the winds and waves in stormy weather.

1. If we assume that the length of the tidal channel is ten miles, measured in a right line, as the crow flies, but thirty miles by the circuitous meanderings of the channel, and that

the total fall—say, for the sake of easy mental calculation—is twenty feet, such data would give an inclination of two feet per mile in a straight line, but only one-third of this in the bed of the river, *i. e.*, a fall of eight inches per mile. The former of these inclinations is uniform, but the latter—the natural fall—is the contrary, as has already been stated, the flow being rapid in some comparatively shallow places, but "boiling" whirlpools in others, and the lengths of the pools generally exceed those of the "rapids," or "races," or "fords," as they are provincially termed.

2. We must next take the reader back to that period in the history of the valley when the tide and river first began to perform their respective operations towards the completion of the channel of the river as it now exists, and here we shall find a very unlevel foundation to work upon, with an excess of mud suspended in the river, and a correspondingly rapid deposit of fresh soil, which fast fills up and levels the hollows, raising the surface, and bringing the whole to its present comparatively level state. But in this natural work of bygone ages we need hardly point out how diversified is the quality of the soil, old and new, which thus forms the channel, as all who have anything to do with rivers of the kind must be practically familiar with it.

3 and 4. Flowing water in a valley has a natural tendency, so to speak, to collect into one volume in a channel, and to scoop out and deepen that channel in a right line by its continuous action; while sea storms and river floods would both play havoc at the commencement of the work in a manner which we shall not attempt to describe. Suffice it to say that both causes work towards a common ultimatum—*viz.*, the present bed of the river—which may safely be left, like all other works of Nature, to bespeak its own philosophy, affording a very instructive lesson to all who comprehend its expressive language. During a flood in the river, for example, the velocity of the current, where it becomes confined between narrow banks, is greatly increased; consequently, sand and gravel brought down with the stream is swept through this narrow part of the channel into the broad-expanding basin immediately below. Here the velocity being insufficient to carry it further, the gravel and sand are deposited, thus forming a shallow bed ultimately, and hence a rapid having an increased velocity during the ordinary state of the river. The details of this will be more fully explained under mountain rivers: at present, enough has been said to account for the natural formation of the unequal inclination of the channels. A velocity of current due to an inclination of two feet per mile would soon sweep away to the ocean in floods the ordinary materials of which the bed of the river was formed, cutting it down to low water, or rather deep-sea level; but the original unlevelness of the ground, and the accumulation of gravel, together with the opposition of the flowing tide, had diverted the stream into the circuitous channel it now occupies of three times the direct line, thereby reducing its velocity in the inverse ratio, or from two feet to eight inches on an average, but less than this over its greater length.

In the tidal portion of rivers, therefore, there should be no narrow and broad places, pools, and rapids, the inclination per mile being reduced to the minimum requisite to keep the channel free from silting at low water. This will depend upon the nature of the soil in the valley, so that every individual case or valley must furnish its own practical rule. If we assume that a fall of six or eight inches per mile is sufficient, and that the length of the river can be shortened two-thirds by straightening the channel, it will greatly increase the fall for drainage at low water above the ordinary limit of the tide, or nearly fourteen to fifteen feet. It is seldom, however, practicable to bring such winding rivers into a right line; but much can be done to straighten, deepen, and shorten them in the vast majority of cases, thereby improving both their navigation and drainage. And this is annually becoming more and more a practical question that imperatively demands public attention; for, as we progress in steam navigation, the old nautical objection to straightening—that the windings and broad places are needful to aid in tacking and beating against the weather—is wholly out of date and no longer tenable.

GEOMETRICAL.

## HAY AND STRAW ELEVATORS.

## AMERICAN LOADERS AND STACKERS.

The paucity of agricultural labourers, and the consequent high price of labour in the United States of America, have greatly stimulated the invention and improvement of "labour-saving machines," and to this general rule hay and straw elevators form no exception. Composed of emigrants from every province of Europe, it was natural for them to carry out with them the labour-saving practices of the mother-country with such improvements as the peculiar requirements of American agriculture demanded, and this is exactly what we find to be the facts of the case as recorded in the earliest writings on the agriculture of the Union. Hence the practice of stacking hay and straw by horse-power has come down from time immemorial to the present day unbroken. In other words, we can trace back the existence of the ship-tackle practices of the mother-country (chiefly England and Holland) to the commencement of the present century; but, prior to that, the chain of history is so broken that the search cannot be further prosecuted: and even up to 1830 much has to be supplied in order to place the subject in a practical working form, agricultural writers apparently taking it for granted that what was generally practised was universally understood. And, doubtless, so it was at the time; but in the United States, as in this country, the progress of mechanical improvement was so rapid and great about the end of the last century and the beginning of the present one, that the farmers of the latter period hardly knew what those of the former practised. But, after the issue of the U.S. patent-office publications, the progress of discovery and improvement is more easily traced.

In this branch of agricultural mechanics, as in reaping machines, our Transatlantic cousins are ahead of us. True, since 1851—what between the stimulus of cheap patents, and the still more encouraging influence of the Great Hyde Park Exhibition of the above year, when McCormick's and Hussey's reapers made such a triumph in our harvest-fields—we have been beating up, and perhaps are at the present time ahead as to straw-elevators; but, when we embrace the operations of loading and stacking hay in hay harvest, the mother-country, it must be confessed, is yet unquestionably a long way behind.

The difference in question no doubt arises from the difference that exists between the state of the labour market in the mother-country and the United States, "*Necessity* proving herself to be the mother of invention" in the latter—thus continuing to verify the truth of the old proverb. And what merits a special notice under this head is the fact that the English farmer had fewer mechanical appliances in stacking hay and straw at 1850—the middle of the present century—than he had at its commencement—1800; hence the characteristically lukewarm reception which Cornes's elevator received when it made its appearance in 1846 at the "Highland capital" of Staffordshire, as Leek has honourably been designated.

Long before 1846 the more successful go-a-head farmers of the New World were loading and stacking both hay and straw by horse-power in various ways as to mechanism—ways which we are only now beginning to imitate, and even squabble in courts of law as to the priority of merit and patent right of the important discoveries we are making!

The different mechanical appliances involved in the American loaders and stackers embrace the following five principles, viz. (1), the old ship-tackle bundling system; (2) a lever fork; (3) "a traveller band;" (4 and 5) the horse-fork, endless rake, and inclined plane. From the United States Patent-office publications already referred to, and agricultural periodicals, it appears that between 1838 and 1845 all the above plans were in keen rivalry and competition both in the patent-office and harvest field; and we further learn, from the claims of patentees, that all the above plans are old inventions, which had been in use from time immemorial, the claims of the inventors being limited to special improvements upon the several old plans in question of loading and stacking hay and straw by horse-power.

We beg to draw the special attention of those of our readers who may wish to examine for themselves the United States' Patent-office publications in the English Patent-office to this peculiar characteristic of disclaiming, as it were, in their claims, what is public property in the old plans, in order to show more clearly the special improvements for which American patents are obtained, lest they should overlook the importance of the practical conclusion to be deduced from it. Further, we are the more induced to do so as they may not have access to the United States' agricultural publications which notice the old loaders and stackers, and improvements thereon that have never been patented.

To notice the annual crop of American patents for hay and straw loaders and stackers during the last twenty-five years, or quarter of a century, is far beyond the limits of our present paper. We shall therefore confine our observations to one or two patent examples under each of the above five principles, and to a few extracts from United States' agricultural and scientific periodical publications describing unpatented examples, and also of the more promising combinations of the several plans; and in doing so we shall rather follow the chronological order of examples, without regard to the order of the above subdivision of principles, as this will illustrate more successfully and intelligibly the progress of improvement both as to loaders and stackers.

Example 1.—Uriah Beebe, of Clarendon, New York, obtained a patent, dated March 28, 1838, for improvements in machinery for conveying straw from thrashing machines. The special claims of the patentee are not given in the Patent-office report of this date. At this period elevators were termed "straw-carriers;" and the one under notice appears to have been somewhat similar in principle to Glandstone's "travelling shaker." When only used for separating the corn from the straw they were, and are still, termed "separators."

Ex. 2.—Russell Tomlinson, Jackson, Michigan, claims, in his patent (No. 4,594, 1846), "hinging the slats, where they are attached to the chains or belts of the straw-carrier or separator, by which means the slats are nearly closed when on the upper side, and open when on the under."

Ex. 3.—Daniel Woodbury, in his patent (No. 6,235, 1849), both disclaims and claims thus: "I do not claim the endless web or elevator (b) in itself as a new invention; but I claim the projections or pins (c) on the said elevator in combination with the rack or slat-frame (d). I also claim the crank with the toothed roller (k), to give this latter a traverse or side-to-side motion—all for the purpose herein described."

Ex. 4.—Adam Linhart and Samuel McClain claim, in their patent No. 6,749, 1849, "wire belts or straw carriers."

Ex. 5.—Cyrus Roberts and John Cox, in their patent No. 8,480, 1851, claim "jumping wheels" under the elevator, to effect a similar purpose to Gladstone's Galloway "jumping wheels."

While American agriculturists and implement makers were thus improving their straw elevators for thrashing machines, others were improving their "loaders and stackers" for loading and stacking hay. Thus, in 1843, we find the "*horse pitch-fork*" successfully at work, pitching one ton of hay 15 feet high in four minutes, which, in a very short time, drove the old Dutch slow-going ship tackle bundling system fairly out of favour in the estimation of every go-ahead farmer—the horse fork being free to the adoption of all from its not having been patented. As the American examples are written by practical farmers, we shall allow them to give their own account of pitching hay by horse-power, by quoting from the *Cultivator*, a monthly periodical similar to the *Farmers' Magazine*.

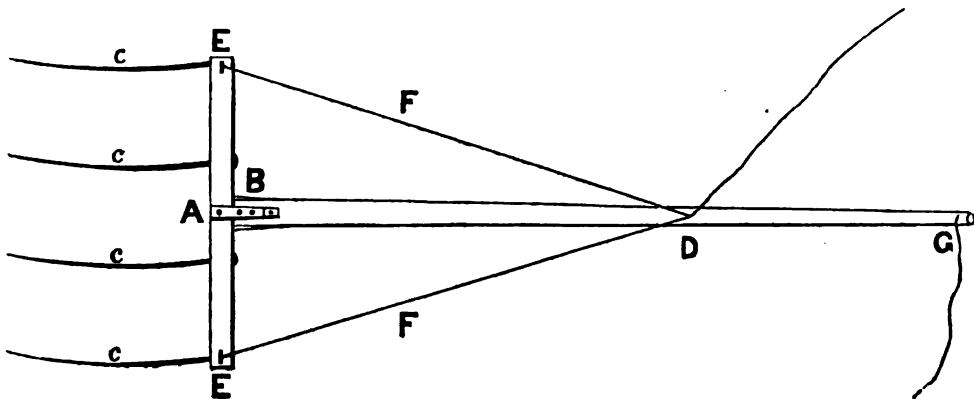
Ex. 6.—"*Pitching Hay by Horse-power*."—Having been a reader of the *Cultivator* for some years past, and having never seen any account of pitching hay by horse-power, I thought the following description of a fork, which I have used for the last five years, might be of interest to your readers. The tool is a great saving of manual labour, especially when the hay has to



be put up in high mows. It is simple in its construction, not liable to get out of order when properly managed, and can be made by our common mechanics at so trifling a cost as to put it within the reach of every farmer.

"The fork may be described as follows: A [fig. 38] is the head, 28 inches long and  $2\frac{1}{2}$  square, of white oak or some

other strong wood; B is the handle,  $5\frac{1}{2}$  feet long, morticed into the head, with an iron clasp, or hand, or hoop-iron to fit tight over the head, and to extend six inches up the handle secured by two good rivets through the handle to increase its strength; CCCC, the prongs of the fork made of good steel and of the right temper, half an inch wide at the head and



[Hay fork, fig. 38.]

drawn out tapering to a point—they are to be twenty inches long, eight inches apart in the head, with a burr to screw them up tight, and a rivet on each side of the middle prongs to keep the head from splitting; EE, staples rivetted over the end prongs to which the rope FF is to be attached—the rope to be drawn together three feet from the head in the form of an A, and then the single rope to extend from that over a tackle block, which is hung to a rafter at the peak of the roof of the barn, and two feet over the side of the mow, and thence to the bottom of the door post where another tackle block is attached, under which the rope passes; G is a small rope attached to the end of the handle, by which the fork is kept level, as it ascends over the mow. As it approaches the place where the hay is to be lifted, the rope should be slackened in the hand, when the hay will tilt the fork so that it will discharge its load immediately. The fork when loaded is raised by a horse, which is attached to a swing tree, to which the rope is fastened near the lower pulley or tackle-block above mentioned. When the hay is discharged from the fork, back up the horse, and be ready for another fork full. The fork is drawn back by the small rope. In this way forkfuls can be pitched up nearly as quick as they can be by hand.

"A farmer that has a large quantity of hay to pitch will more than pay for the trouble and expense of a fork of this kind in a single year. With the assistance of a boy to lead the horse to the fork, a man can with ease pitch off six tons of hay per hour, and pitch it from fifteen to twenty feet high. On a trial of speed, I have pitched a ton fifteen feet high in four minutes. The fork does not cost over five dollars, without the blocks and ropes; and I think they can be had altogether, ready for putting in operation, of Garret Brown, Newton, Bucks County, Pa., for seven dollars. (Signed) "A PRACTICAL FARMER."

"Bucks County, Pa, April 1848."

Ex. 7.—(From the *Cultivator*, 1851.—"PITCHING HAY BY HORSE POWER.—I have used a horse pitch-fork similar to that represented by a correspondent of the *Cultivator* for 1848, page 122. It operates as well as there recommended. My object in referring to it here is to furnish occasion to add that I have not only succeeded as well as I expected in the barn, but also in pitching on to stacks. My method of arranging the machinery for pitching on to stacks is as follows: I procured three poles, and chained the small ends together in a proper manner, and raised them in the form of shears, with a pulley suspended at the top over the spot where I wanted the stack. The rope to which the fork is attached is put over the pulley before the poles are raised, then under another pulley in the bottom of one of the poles, about two feet from the ground. A stake is then driven into the ground

at the foot of this pole, to prevent it from being pulled out. Hitch on a horse to the rope, and all is ready. Two of the poles should be about thirty-three feet long, and the other thirty-nine feet. The object in having one pole longer than the others is this: when the fork is stuck in the load, and the horse is pulling on the rope, the poles are likely to be pulled towards the load if they are of equal length; but if one of the poles is a few feet longer than the others, the load can be drawn between the stack and the long pole, and the pole acting as a brace, will make it impossible to pull the three over by pitching. The poles should be as small as can be had of sufficient length, and of some light timber. Mine are bass-wood, about five inches in diameter at the butt. One man can handle them, one at a time; and two men can raise them.

"Sylvania, Bradford Co., Pa." (Signed) "P. P. P."

Ex. 8.—(From the *Cultivator*, 1856, by "P. P. P.," the same correspondent as last, ex. 7.)—"PITCHING HAY BY HORSE POWER.—Mr. P. P. Peckham, of Sylvania, Bradford County, Pa., writes as follows: 'In describing L. F. Allen's barn in the *Annual Register* for 1856, page 179, it is very properly suggested that something is desirable for unloading hay, &c. The plan proposed is so far in advance of the hand-method that I could like it if I thought it the best that might be adopted. Allow me to propose the horse pitch-fork, as described in a back volume I copied from the *Cultivator*, and made the first fork of this kind known in this part of the State about five years ago. Now I think it would be safe to say that about two hundred are in use, and liked well. Some say they would not take a hundred dollars for a fork, if they could not get another. I am aware that an elevator would carry the hay on to a mow, but would be more in the way, and could not be made to carry the hay to any desired locality, as the fork would; besides, with an elevator, all the hay would have to be pitched by hand on to the elevator from the load.'"

Both the old bundling system and traveller bands were proposed for Mr. Allen's barn, and we quote the example to show that both were being fast superseded by the horse pitch-fork.

The next example is also from the *Cultivator*, May, 1859, written apparently by the editor, and embraces patented improvements on the common horse pitch-fork in use.

Ex. 9.—"Every farmer who has ever pitched off from a waggon in a day ten or twelve tons of hay is aware that no labour on the farm can be more fatiguing. The common horse-fork, which to a considerable extent has been brought into use, has afforded great relief, this severe work not only being avoided, but much greater expedition attained. The effective force of a horse is at least five times as great as that of a stout man; and if half an hour is usually required to un-



load from a waggon a ton of hay, then only six minutes would be required to accomplish the same result with horse-power. Actual experiment very nearly accords with this estimate, five to seven minutes only being required by the assistance of the best horse-forks.

"There are, however, some difficulties in the use of the common horse-pitchfork. The most so results from the necessity for the handle of the fork to sweep upwards in a vertical position whenever the hay is dropped from it, and, falling back, it is in danger of striking the operator. It is hence impossible to use it under a low roof beyond perline beams, or when the mow is nearly filled. To remove these difficulties, C. E. Gladding, of Troy, Pa., has recently constructed a fork which, after a recent trial, we are satisfied is an important improvement. It differs from the common horse-fork (Ex. 6, fig. 38) by placing a hinge-joint at the connection of the head with the handle, so that at any moment by a jerk on the cord, which passes up a bore in the handle, the fork is dropped and its load deposited. This may be done the moment it happens to be swung to the most favourable spot. The fork is so hung that its weight causes the head to fly back of its own accord and resume its former position, where it is held by an iron catch until the next forkful is to be discharged. It should be observed that the pulley of the rope suspending the fork should be fastened to the highest portion of one of the rafters over the mow, and a smooth board should be placed vertically against the face of the mow for the forkful of hay to slide against in its ascent. By attaching this rope in front of and within a window, the hay is carried with ease in at the window; and thus lofts over sheds, carriage-houses, &c., where the common horse-fork could not be used, are filled by the use of Gladding's improvement. It may (as well as the old fork) be also used for stacking by making a tripod of three long poles from which to suspend the implement."

Thomas F. Jarrett, of Horsham, Montgomery County, Pa., obtained on May 17, 1854, a patent (No. 10,989) for an improved horse-pitchfork of the above kind, and the following is his claim: "I claim setting the catch free when the elevator reaches any desirable height, by connecting the said catch with a weight by a rope, whose length is adjusted in proper relation to the height as described to make the weight operate on the catch precisely when the elevator reaches such a height."

Ex. 10.—U.S., patent, No. 13,908, 1855. A hay-loading lever-fork, actuated from the wheels of the cart. Patentee, John K. Harris. The patentee, in his claims, states that elevators on the endless-web plan were in common operation in the States at the time, and this is the only thing worth quoting.

Ex. 11 (1850).—A series of rakes on an endless belt, &c., for raking the hay from the windrows up an inclined plane into the cart. It is attached to the back part of the cart, and actuated from the wheels. In 1855 there is another example of this kind, but without an inclined plane—viz., No. 12,547. In loading hay, the horses have to haul this cart upon the windrow. But, no doubt, our Transatlantic cousins will get over this objection by "placing the cart before the horses!" or what would be preferable by making the machine rake the hay laterally into the windrow from each side, and by the second and conjoint process of raking it up into the cart, or by a better plan than either of these examples.

In stacking hay by horse-power, the reader will have perceived that the horse-pitchfork takes the place of the bundle, the poles, blocks, and tackle in other respects being similar in both cases, and that the improvement is a question of expedition in favour of the fork. There are, however, several practical objections to the above plans of working the fork, and the following two examples (12 and 13) will show how these are being obviated. The two principal objections are, we may here observe, the depositing of the hay upon one part of the stack only, and the other is the plank against the side of the stack. The improvements therefore consist in giving the fork first a vertical movement and second a horizontal one, and this is now being done as follows:—

Ex. 12.—The pulley over the mow in the barn, instead of being attached to a rafter, is suspended from a small travelling-carriage, that works upon a railway having sufficient inclination to bring back the empty carriage and fork when freed from their load. A second pulley is required at the upper end of the inclined plane or railway. By determining the proper length of the catch-rope and of the horse-path, the mechanical

reader will readily perceive that the fork-falls may be deposited anywhere along the length of the mow or stack.

Ex. 13.—"Turner's Derrick Elevator, 1864." The title of this machine conveys in the single word *Derrick* a general outline of its mechanism. In principle it is the old Dutch mast and yard, only the yard is rigidly fixed to the mast, while the mast turns in a socket in the bottom and in the collar of a tripod half-mast high, and thus swings the fork-falls on to the stack.

Ex. 14.—The elevation and conveyance of hay and straw in bundles has several things to commend it. Indeed the only objection to the practice of bundling is the manual labour hitherto experienced in the formation of the bundles, for a man would pitch a load of hay in less time than he would require to bundle it. But with straw from a thrashing machine, when it has to be carried to a short distance, it is otherwise, the odds being then against the fork. Consequently for the last twelve years and upwards numerous attempts have been made to solve the problem of self-bundling apparatus, *i. e.* to make the thrashing machine do the work of bundling; but up to a recent date a self-bundling elevator had not been discovered, or at least has not been made public in the United States. American farmers however have long been able to make the bundling apparatus self-discharging by mechanism similar to that used by Jarrett in discharging fork-falls from the horse pitch-fork. And we may observe that the first example of this kind which came under our notice was a non-patented one some ten or twelve years ago in an American agricultural periodical.

Ex. 15.—Instead of bundles, by means of slings and similar contrivances, one American farmer proposes elevating hay and straw in nets. Thus when he began to load his hay he spread a net over the bottom of his cart. When half full, he spread a second net; so that when taken home to the barn or stack-yard, first the one netful was elevated by horse-power and tackle, and then the other, the whole load being thus elevated at two operations.

Some six or seven years ago the old American pitch-fork (fig. 38) was made and used in this country, near Banbury, and we believe may yet be seen in operation. It is the only example we have heard of.

ENGINEER.

## NORTH LINCOLNSHIRE AGRICULTURAL SOCIETY.

The prize of £20 for thorough-bred stallions for hunters, which award we were unable to give last month, was given to Mr. Robert Betts, Holbeck Lodge, Horncastle, for Eloc, 6 years old, sire Venison, dam by Defence.

The following is a list of

### AWARDS FOR IMPLEMENTS.

Amies and Barford, Peterborough.—Set of harrows for light land, £2; clod crusher, £2; wrought-iron field roller, £2; American grist mill, £2; set of steaming apparatus, £1 10s.; straw elevator, £2; water cart, 10s.

Ashby and Jeffery, Stamford.—New patent haymaker, 10s. Wm. Ashton, Horncastle.—Drag and steel cultivators, £1; horse-hoe for turnips, with steel shares, £1; one-horse grubber, £2; set of chain harrows, £2; stook mover, 6s.; lever lifting jack for waggons, 5s.

B. H. Bental, Heybridge, near Maldon.—Subsoil plough, £3; chaff cutter, £1; turnip cutter, £1 10s.; oilcake breaker, £1; horse gear, &c., for two horses, £1.

John Boyers, Market Rasen.—Set of gig harness, with brass furniture, 10s.; set of four-horse gears, ditto, 10s.

Thos. Bradford and Co., Manchester.—Family combined washing, wringing, and mangling machine, 10s.; churn, 1s.

Thos. Brook, Market Rasen.—Two-horse harrow, £1; turnip cutter, double action, 10s.

George Cheavin, Boston.—Self-cleansing water filter, 6s.

John Cooke and Co., Lincoln.—Two iron ploughs, £3.

James Coultas, jun., Spittlegate, Grantham.—General purpose drill, 6 ft. 6 in., twelve rows, £4.

J. Coultas and Son, Little Gonerby, Grantham.—General purpose drill, 7 ft. 6 in. wide, £3.

L. Dawson, Market Rasen.—Broadshare and scarifier, £3.

Farmer and Son, Gainsboro'.—Two-horse mower, £3.

William Foster, Lincoln.—Combined portable finishing thrashing machine, 25.

Hy. Grantham, Fulstow, Louth.—Dressing machine, £1.

Thos. Gell, Hemingby.—Market cart on springs, 10s.

Hays and Son, Stamford.—Two-horse cart, with harvest-raves and fixed sideboards, £2; one-horse Scotch cart, with harvest raves and sideboards, £2.

John Hodgson, Louth.—Six swathe rakes for heavy land, 10s.; four bundles of hay forks, 10s.

Richard Hornsby and Sons, Grantham.—Champion plough, R.A., with two wheels, £3; patent wringing and mangling machine, 10s.; general purpose horse hoe, commended.

George Hunter, Uxley.—Drag or cultivator, £3; ridge drill, £3; set of harrows for light land, £1.

William Ingall, Normanby-by-Spital, Market Rasen.—Light two-horse waggon, with iron arms, £4.

Dymoke Korman, Winthorpe, Burgh.—Fire engine, 5s.; 12 American clothes wringers, 6s.; three clothes dryers, 6s.; collection of champion carpet-sweepers, 5s.

Benj. Kittner, Fulsot, Louth.—Corn-dressing machine, £2; blower, £1 10s.; elevator, 10s.

Marshall (Brothers), Kirkby-on-Bain.—Corn-blower, 10s.

Marshall, Sons, and Co., Gainsborough.—Patent complete thrashing and dressing machine, with grinding apparatus, £5.

### THE TRIAL OF REAPERS.

This trial took place at Linwood, on the Lincoln and Wragby Road, about two miles from Market Rasen, on the farm of Mr. Burwell, on Wednesday. The business commenced on a field of wheat south of the Busingthorpe Road, where about 3,000 persons were present, including the representatives of Samuelson and Co. of Banbury, Cuthbert of Bedale, Croskill of Beverley, and Mr. J. Fletcher of Winterton. After the wheat had been reaped, a field of oats on the north side of the farm, of about 15 acres, was also cut. The machine of Messrs. Samuelson was 35 minutes in reaping one and a-half acres of wheat, and only 31 minutes in cutting the same amount of oats. The next nearest in time was the Beverley Iron and Waggon Co.'s, but the judges awarded the prizes to the latter machine, thinking that for all the requirements of the farm it was the most suitable. The awards are as under:

For the best two-horse machine reaper, with side self-delivery. First prize, £20, to Mr. Brooke, of Market Rasen, for the Beverley Waggon Co.'s reaper. Second of £10 to Messrs. Coultas, of Grantham, for the same kind of machine, manufactured and patented by Messrs. Samuelson, of Banbury.

Second Class.—First prize, £12, to Mr. Henry Smith, of Winterton, near Brigg. Second of £8 to Mr. John Fletcher, of Winterton. This reaper had only been tried for a day or two, and therefore stood well as a novelty of manufacture by the exhibitor and manufacturer.

Third Class.—First prize, £8, H. Smith, of Winterton, for Cuthbert and Co.'s one-horse reaper. Second of £5 to T. Simpson, of Lincoln.

### ROMSEY COUNTY COURT.

[JULY 25TH.]

IMPORTANT TO FARMERS.—DIXON AND CARDUS v. STEPHEN AYLES.

The plaintiffs in this case, who are oilcake makers at Northam, sued the defendant, who until the last few months occupied a farm at Braishfield, for the sum of £13 odd, the balance of an account for linseed cake sold in May, 1864. The defendant refused to pay the amount until he had been recompensed for the loss of a large number of lambs which he alleged had been killed by eating the cake supplied by plaintiffs.

Mr. Leigh appeared for the plaintiffs, and Mr. Mackey for the defendant.

Mr. Cecil Dixon sworn: In May, 1864, we sold Mr. Ayles two tons of linseed oilcake. We sent out about 4,000 tons a-year. Part of the cake has been returned, leaving a balance of £13 odd.

Cross-examined by Mr. Mackey: Mr. Ayles said he would pay the balance when he had been compensated for the loss of his lambs. Mr. Ayles wrote for the cake, and we sent it by rail to Romsey. We sell this cake for sheep. We sell it as good oilcake. About the same time we sold cake to Mr. Burney, Mr. Wallace, Mr. Lywood, Mr. Reeves, and other gentlemen. Complaints were made to us by Mr. Wallace that between 40 and 50 of his lambs had died through eating our cake. The oilcake was composed of linseed, bran, and ground

arashide nut. Cake is not supposed to be made of linseed only. The proportions of the various ingredients vary according to the quality of the seed.

Cross-examined by Mr. Leigh: Bran would not make the cake unwholesome. We sold cake to several hundreds of customers at the same time. We only had complaints from this neighbourhood. We had no complaints of any ewes having died. We have to sift the seed when it comes over, and the quantity of weed seed and other things taken away would be a considerable loss to us if we were not to replace it by something else; and if the cake was only made of linseed we should soon be in the bankruptcy court. All oilcake makers use the same ingredients.

Mr. Joseph Mee said: I am agent to Messrs. Dixon and Cardus. I sold oilcake to two or three hundred parties at the same time. I only had complaints from parties in this neighbourhood. There was great mortality amongst lambs that season. I only know of the composition of oilcake from seeing the manufacture.

Cross-examined by Mr. Mackey: There was nothing more used for this particular batch of cake than at any other time. None of the parties told me directly that the oilcake had killed their lambs. Mr. Ayles sent some of his back, saying that it had killed his lambs. Mr. Wallace said he had lost 40 lambs. Mr. Burney did not speak to me about his lambs. We never bought charlock seed to mix with linseed cake, but for rape cake for manure. I bought 50 lambs of Mr. Wallace after he had complained to me.

Mr. W. H. Gulliver sworn: I received 50 lambs from Mr. Mee, and fed them on Dixon and Cardus's cake, and they thrived well.

This was the case for the plaintiffs.

Mr. Mackey, on the part of the defendant, said that he should prove that the lambs died from eating the cake, as Mr. Ayles had parted his lambs, and those that eat the cake died, and those lived that had none, and many other similar cases.

After a little consultation on the part of the defendant and his friends, they agreed to a verdict for the plaintiffs, as His Honour said that if the case was adjourned the cost of bringing various witnesses to prove it would be very heavy.

### THE ROYAL MEETING AT PLYMOUTH.

The following are the attendances day by day:—

	Persons.	Amount.
Saturday, July 15...	25 .....	6 5 0
Monday, " 17...	1,063 .....	265 16 0
Tuesday, " 18...	4,767 .....	595 11 10
Wednesday, " 19...	17,269 .....	2,159 0 0
Thursday, " 20...	42,943 .....	2,147 14 10
Friday, " 21...	21,969 .....	1,099 12 7
	88,036	£6,274 0 3

### AN ACT TO ALLOW THE CHARGING OF THE EXCISE DUTY ON MALT ACCORDING TO THE WEIGHT OF THE GRAIN USED.

(Printed by Authority, June 29, 1865.)

This Act will come into operation on September 1 next.

Any maltster wishing to pay duty on the weight of the corn or grain used must give notice in writing to the officer of Excise, which notice would have to be renewed if the maltster discontinued making malt for one month.

Every maltster, prior to placing corn or grain in any cistern for the purpose of malting, must affix a cover to such cistern, with fastenings, &c., to the satisfaction of the officer of Excise.

Forty-eight hours' notice must be given in writing of the day and hour (not later than 12 a.m.) that the maltster intends to steep his grain.

Maltsters must provide correct scales, weights, and bushel measure, which shall at all times be kept in the malthouse.

If the weight of grain is found to exceed the declared weight by 2lbs. per bushel, the penalty will be 100s.

This Act will not repeal any provisions of other malt acts, and will continue in force for four years.

## THE OIL REGIONS.

The word "bitumen" is a generic one, comprehending several varieties or species of inflammable substances, found in, and proceeding from the bowels of the earth, applicable to different purposes, and all possessing the same characteristics, namely, 1st, that by exposure to the air and the application of heat, they burn with a flame more or less vivid, leaving no, or scarcely any residue. 2nd, That by distillation they yield a liquid acid, but no ammonia, a small variable proportion of charcoal being left behind in the retort. 3rd, That they are either liquid or are capable of being rendered so by a moderate degree of heat.

Naturalists have divided bitumen into two families—the non-elastic and the elastic. The former comprehends naphtha, petroleum, mineral-tar, mineral-pitch, and asphaltum. The latter includes mineral-caoutchouc and suberiform-mineral-caoutchoucs. A description of these will show that they are but modifications of the same substance, assuming different forms, but evidently proceeding from the same common origin, which are believed to be the coal-fields, deep down in the earth, the large cavities of which must possess inexhaustible supplies. In proof of this, we may state that the walls of Babylon and those of the tower of Babel itself (according to the Scriptures) were built of unburnt bricks, *cemented with bitumen* taken from springs of that substance found on the banks of the Euphrates, which have continued flowing ever since to the present day. The following is a description of the different kinds of bitumen as named above:

**I. The non-elastic Bitumen.**—1st, Naphtha: This substance is of a light brown or pale yellow colour, quite fluid, and transparent. It is the lightest of all liquids, its specific gravity being 0.708 to 0.732. It has a pungent penetrating smell, takes fire readily, and burns with a bluish yellow flame, leaving no residue, but emitting and depositing an abundance of carbon in the form of smoke and soot. It may be rectified by distillation with water, in the same manner as the essential oils, and then becomes colourless and weaker in its odour. It does not combine in any considerable degree with either water or alcohol, but unites readily with either turpentine, caoutchouc or the essential oils. When rubbed with the caustic-fixed alkalies, it forms a kind of "Starkey's soap." The concentrated nitric and sulphuric acids are decomposed with vehemence upon it, converting it into a solid resinous substance, soluble in alcohol. Even the purest naphtha, when exposed to the air, becomes first of a yellow and then of a brownish colour, acquires a somewhat viscid consistence, and then passes into petroleum. Naphtha is procured, for the most part, from very copious springs of the substance at Baku, on the shores of the Caspian Sea, where it is collected into earthen pipes, and conveyed to the towns and villages, to be burnt in lamps, &c., instead of oil; it is also used medicinally both externally and internally, in rheumatic and other chronic complaints. It is found pure in several parts of Italy.

2nd, Petroleum, or rock or stone oil, is of a blackish or reddish brown colour. It is fluid, but somewhat viscid, and almost opaque, exhaling a strong bituminous smell. Its taste is pungent and acrid; its specific gravity 0.747 to 0.854. It may be rectified by distillation with water, in which process the carbon, which thickens and colours it, is left behind in the retort, and a colourless fluid comes over, possessed of all the properties of naphtha. When petroleum is distilled *pure*, there first arises some naphtha, then a watery empyreumatic acid, and lastly a thick dark-coloured oil, a spongy coal remaining in the retort. In its combinations with and chemical union upon other substances, it perfectly resembles the preceding species. It is found wherever naphtha is, and in many other places among stratified mountains, in the vicinity of coal. In England, Colebrook Dale and other parts of Shropshire are the principal places where petroleum is found. In some of these, extensive strata of sand-stone are saturated with it, and the naphtha procured by distillation of the stone was formerly sold under the name of "Betton's British oil," and was esteemed an active remedy in sprains and rheumatism.

3rd, Mineral-tar differs from the foregoing only in degree.

It is more viscid, opaque, of a darker colour, and leaves a larger carbonaceous residue. It is found in nature together with petroleum, and may also be procured by distillation from coal.

4th, Mineral pitch is similar in external appearance to common pitch. When heated, it emits a strong unpleasant odour. In cold weather it may be broken, and exhibits a vitreous lustre; but when warm, it is soft and tenacious.

5th, Asphaltum: The colour of this substance is brown, or brownish black. It is light and brittle. When broken it displays a conchoidal fracture and vitreous lustre. It has little or no odour, unless it is rubbed or heated. It is considerably inflammable, melts easily, and burns away without leaving any residue in the retort. It is principally found on the shores of the Dead Sea in Syria, and in the island of Trinidad in the West Indies.

**II. Elastic Bitumen.**—1st, Mineral caoutchouc in colour varies from yellowish brown to olive brown, and blackish or reddish brown. The light coloured is often in a semi-fluid state, and adheres to the fingers; the olive brown is elastic and solid; the blackish and reddish brown are hard, and have little elasticity. It is found in a stalactical form, or in masses. Its specific gravity, in the softest varieties, is about 0.9, and in the hardest and least elastic 1.2. It passes into asphaltum, and is partly soluble in sulphuric ether. But the residue of the solution, after evaporation of the ether, is not elastic, thus forming an essential difference between the vegetable and mineral caoutchouc. This singular material has hitherto been found only in the cavities of a lead mine near Castleton in Derbyshire, called the "Odin mine," accompanied with asphaltum.

2nd, Suberiform caoutchouc: When recently cut, it resembles firm close cork in its colour and texture; but, by exposure for a few days to the air, it becomes of a pale reddish brown colour. It is also sometimes found friable, and passes by decomposition into an ochreous powder. It has only been found in a rivulet near the Odin mine, whence the preceding is obtained, and appears to differ from it merely by being penetrated by water. It occurs in nodules of various sizes, some weighing upwards of 13 lbs., the nucleus of which is very commonly the brown perfectly elastic mineral caoutchouc.\*

Of these different substances, petroleum is the most important and the most abundant in those parts where it is found. Thus, in the Birmese Empire; it is so plentiful that in one mountainous district five hundred wells have been sunk, from which 400,000 hogshheads are obtained annually. It was formerly exported from thence to the United Kingdom in the crude state; but lately an English company was established in India for the rectification of the oil, which is now brought over in a pure state, by which a considerable saving of carriage is effected. The quantity from this source will probably increase; but the distance must cause the freight to be very high, probably too much so to compete with the United States, whence an equally abundant supply can be obtained, an account of which we shall now proceed to give.

The districts of the United States, in which the greatest supplies of petroleum are obtained, are the western part of Pennsylvania, Western Virginia, and Eastern Ohio; but, recently, oil-mills have been sunk in the States of New York and Michigan, and also in Canada. The most productive are those in Venango, Crawford, and Warren counties in Western Pennsylvania, through which flows the stream now called "Oil Creek," which has become celebrated as the site of the richest oil-producing region at present known in the world. It is a meandering mountain stream, that takes its rise in the northern part of the State of Pennsylvania, near the south line of Erie county, and with its tributaries waters Crawford and Warren counties. After a course of about thirty miles it unites with the Alleghany river, seven miles from the town of Franklin. "The valley through which Oil Creek takes its

\* The account of these different species of bitumen is chiefly taken from Rees' Encyclopedia.

course," says the account from which we derive our information, "is narrow, and flanked on each side by high and rugged hills, on the top of which are broad fields of excellent farming land. The scenery on Oil Creek at one time no doubt was quite picturesque; but now, the bottom lands are dotted with tall derricks, wooden engine houses, and iron smoke-stacks, out of which columns of black smoke roll upwards to the clouds. The pines and hemlocks are cleared from the mountain sides, and all is busy life."\*

This entire region was formerly the great source from whence the valley of Ohio and Mississippi obtained their chief supplies of lumber, or timber. In the spring of the year, when the mountain streams were swollen by the melted snow and ice, thousands of long rafts were sent down by them into the Ohio and Mississippi rivers, after passing through the saw-mills on Oil Creek, near Titusville, by which they were in some measure "licked into shape." It was near these mills oil first made its appearance in large quantities, so that Titusville has unwittingly become the "metropolis of Petrolia," the population having increased from 150 to 3,000. About half-a-mile below it, Oil Creek meets its principal affluent, Pine-creek, now better known as the "east branch of Oil Creek"; and it is remarkable that the *della* formed by the union of these two streams is covered with old oil-pits, supposed by some to have been the work of the French settlers about the middle of the last century, situated, as they are, between the French forts of *La Bauff* and *Venango*; but the writer of the account believes that they were constructed by the Indians before the appearance of the white man in that region; and this opinion is sustained by the following circumstance: In sinking a well recently in the neighbourhood of Titusville, five feet beneath a spot where a tree stood was found a wooden well-curb, or mouth of an old oil-pit, in a good state of preservation. By the rings of the tree it must have been two hundred and forty years old, which fixes a date for the well far anterior to the settlement of the French in the vicinity.

The land of this region was the property of the "Holland Company," to whom it was granted for money advanced to Congress during the Revolution. Towards the close of the last century it was divided into lots of four hundred acres, and sold at very low prices. Such was the rush of migration to the west that the Venango region was neglected, and was slowly settled until 1797, when Jonathan Titus and Samuel Kier arrived there. The former purchased a tract of several hundred acres, on which Titusville is built, and part of the land is now vested in the "Titus Estate Petroleum Company," of New York. Petroleum certainly, under the name of "Seneca oil," was early known to the settlers, and was used by them both medicinally and for lighting and lubricating purposes. It was chiefly obtained from two natural springs, one of which was in the immediate neighbourhood of Titusville, and on property now belonging to the "Watson Petroleum Company" of New York. The other spring was on the farm of Hamilton McClintock, within four miles of the mouth of Oil Creek.

The first attempt to collect the oil was made by Dr. Brewer, of the firm of Brewer, Watson, and Co. This, however, only applied to the surface oil, which was absorbed in blankets, from which it was wrung out, and used for lighting the lumber-mills of the region. This was found so useful and cheap that in 1834 a company was formed, and termed "The Pennsylvania Rock-oil Company," being the first oil company ever formed; and prior to the sinking of oil-wells being even thought of, the company purchased 100 acres of land on Oil Creek, below Titusville, for the purpose of collecting the surface oil; but the scheme was soon abandoned, and the company dissolved.

The oil movement remained in abeyance for three years, although Professor Silliman had analyzed the oil, and given a favourable opinion of it. But in the winter of 1857 Colonel Drake arrived at Titusville, and having examined the oil-springs, came to the conclusion that rock-oil could be obtained, like water, by sinking a well. Acting at once on this conviction, he induced James M. Townsend and E. B. Bowditch to join him in taking a lease of the lands of the "Pennsylvania Rock-oil Company" for the term of twenty-five years, for the purpose of boring for oil. With this lease Colonel Drake,

with friends from Connecticut, formed a company called "The Seneca Oil Company," for the purpose of sinking wells under the direction and control of the colonel. In the following spring he removed, with his family, to Titusville, then a village of a hundred and fifty inhabitants. Having made himself acquainted with the subject of boring, he procured a man from the salt-springs on the Alleghany Mountains; but the man failed to keep his engagement, and a whole year was lost before he could procure another, and commence operations. After encountering many obstructions and disappointments, chiefly from the caving-in of the side-earth of the well, he had recourse to boring; and on the 29th August, 1859, at the depth of 69 feet 6 inches, he struck a vein of oil, from which he soon pumped at the rate of from thirty-five to forty barrels per day. This was the first petroleum that was ever obtained by boring.

The excitement occasioned by Drake's success was only second to that of the discovery of the gold-fields of California and Australia. Thousands of speculators poured into the district from the neighbouring States—merchants, lawyers, farmers, even preachers, abandoning their callings, rushed to the oil region and purchased or hired land, which rose in value to fabulous prices. The firm of Brewer, Watson, and Co., already referred to, took a lease of the farm of Hamilton M. Clintock, and commenced sinking a well, which found oil at the depth of seventy feet. Many other wells were sunk on different farms, and the whole district became studded with derricks and buildings suitable for the operations. The produce of these, however, though remunerating, was as nothing compared with one sunk in 1861 by A. B. Funk, which at the depth of 470 feet struck a reservoir, from which flowed spontaneously a stream or fountain of petroleum; others now adopted the plan, and one well on the Buchanan farm yielded, without pumping, one thousand barrels per day. Then comes the Empire well, pouring out 3,000 brls. per day; next the Sherman well, in April, 1862; and the next year the "Noble and Delemaire" well, which, after having been bored 167 feet, was abandoned. But soon after the proprietor, Mr. Noble, recommenced the work, and bored to the depth of 471 feet, when to his astonishment, the petroleum began to flow copiously, and yielded a rich return for the labour bestowed upon it.

This discovery of "flowing wells" produced such an abundance of the material that pumping was abandoned as unprofitable. The reader will be able to form some idea of the quantity of petroleum obtained, from the fact that the firm of Brewer, Watson, and Co. expended 750,000 dollars for barrels alone before they had realized any profit. They were, in fact, the pioneers in the movement, and, in the end, reaped an abundant harvest from their efforts. At their establishment at New York they made great exertions to introduce the article to general consumption. This required much time and labour, and before it was accomplished the price of the article fell so low as from 10 to 50 cents per brl., (or from 5d. to 2s. 1d.), and a large quantity was allowed to run into the creek, the owners not being willing to expend money for barrels to receive it.

The first person who attempted to refine the crude oil was Samuel M. Kier, of Pittsburgh. This was an important discovery, and was immediately adopted by W. H. Abbott, of Titusville, who erected the first large refinery at that city. There being at that time no railroads to the works, the iron required was conveyed in waggons through roads axle-deep in mud; and so disheartened were the parties concerned that they would have abandoned the enterprise, but for the energy of Abbott, who persevered till the building was completed.

An unfortunate accident occurred soon after the discovery of the flowing wells. From some unknown cause, the oil at the "Brown Well" took fire, "and," as described by an eye-witness, "columns of black smoke rolled upwards into the air, the blazing oil leaped heavenward, and, falling over on all sides from the fiery jet, formed a magnificent fountain of liquid fire. The sight was awfully grand; but sad to relate, nineteen persons were burned to death. Among them was Mr. Rouse, one of the proprietors of the well. He lived for several days after being injured; and in framing his will, after making certain bequests, left to the county of Warren a handsome sum, to be applied, one-half for road purposes, and one-half to the poor of the county. This bequest is now valued at 150,000 dollars, or £30,000 sterling.

The low price of petroleum, consequent on the enormous

\* Harper's New Monthly Magazine, p. 563.

supply suddenly obtained before a regular or adequate demand existed, produced the natural effect of causing a suspension of the works, and in most cases the abandonment of the wells altogether. The "oil bubble," as it was termed, was said to be exploded, to the great delight of those prophets whose predictions on such occasions are "always of evil and never of good," and who always rejoice in their fulfilment, whatever suffering it entails. It was, however, but for a short time; for very soon a demand sprung up for petroleum for lighting purposes, and it came into universal use, as unequalled for cheapness and purity of flame. Again thousands of speculators poured into the "oil region," in which refineries sprung up as if by magic, and all was activity and excitement. Railroads were laid down, fresh lands were leased at high rates. Tow-boats laden with barrels, full or empty, were constantly plying to and fro. Farming was abandoned, villages suddenly grew into populous towns, and the whole face of the country became one scene of bustle and activity. The following description of the oil-region at the opening of the present year will, we trust, be interesting to the reader.

Titusville is situated at the head of Oil Creek, and in Crawford County, Pennsylvania. Previous to the discovery of the oil fountains, the only trade of the place was in timber, which was then sold at from five to ten dollars per thousand feet for the best qualities. It is now worth from twenty-five to fifty dollars, and the demand is greater than the supply. The number of houses is more than one thousand. The imports of merchandise by rail in 1863 was 70,000 tons; and the exports of oil 750,000 barrels. It is estimated that in this year (1865) the entire exports from Titusville will amount to 18,000,000 dollars, or £3,600,000 sterling. The wooden buildings are giving place to stone and brick, and building-lots are selling at from 1,200 to 1,800 dollars per lot.

The bottom lands below Titusville consist of a rich tract, on which flowing wells are situated; and the oil from them is said to be of a superior quality. It is supposed that by sinking to the depth of 1,300 feet a larger flow of oil than any yet discovered will be reached; but this is at present only conjecture. Wells are now sunk along the entire line of Oil Creek, north of Titusville. A railroad has been constructed as a branch from the Great Western and Atlantic Railroad. It passes through Titusville to the Schaeffer Farm, which is mid-way between Titusville and the Oil City, or about seven miles from each. The railroad is about to be continued to this latter place, which is situated at the base of a mountain, and at the mouth of Oil Creek. It consists of only one street, and being confined within a narrow space can never become a large town. There are five or six hotels in the place, which are usually filled with strangers, looking out for lots on which to build houses or sink wells. Besides Oil City, several other towns have sprung up in the oil region, as Funkville, Petroleum Centre, and M'Clintockville. This latter is situated on the M'Clintock Farm, the mills on which belong to the M'Clintock Petroleum Company of Philadelphia. About seven miles below Oil City, and at the confluence of French Creek with the Alleghany River, is the town of Franklin. It is situated in Venango County, and is the terminus of the Atlantic and Western Railroad. It is a place of considerable trade, and thousands of barrels of petroleum are shipped or sent per rail from thence. French Creek is a large stream here; it rises in the southern part of New York, and running nearly parallel with Oil Creek, empties itself into the Alleghany River. Its banks are studded with derricks, indicating the existence of wells along its course.

Oil is found in large quantities on both banks of the Alleghany river for twenty miles above Oil City. The most celebrated are the Economite wells; but others are now being worked equal in yield, and the land is fast letting or selling at very high prices. Most of the wells are flowing over, and require no pumping. The town of Tideoute, in Warren County, receives part of the produce of these wells, and ships it by the Alleghany River, on the west bank of which it stands. Another portion is taken in tow-boats to Irvine, fourteen miles above Tideoute. These boats are drawn by horses, and carry from 150 to 300 barrels of oil each. The horses often cross and re-cross, and sometimes draw up the centre of the river against the stream. Cherry-run is another river on which oil is found in large quantities. The great Reed Well on this stream yields 280 barrels of oil daily; and the land on the

banks of this and some neighbouring rivers has been purchased at very high prices. Hundreds of wells are being sunk or bored on the sides of these streams. In short, the entire counties of Venango, Warren, and Crawford, are now being prospected for oil; and one cannot traverse the country in any direction without meeting with parties seeking new oil-lands.

Refineries for purifying the petroleum are rising up everywhere, and great improvements have been made in the mode of distilling the oil. The largest establishment for the purpose is at Corry, in Crawford County, Pennsylvania. It is a brick building, and cost, with the machinery, 150,000 dollars, and employs upwards of 200 workmen daily, requiring 300 barrels of crude oil daily to supply it.

Virginia has its oil region, comprising the counties of Pleasant, Richie, Wood, and Wirt. Ohio also has numerous territories in which oil is found. On the Cow-neck Creek in Virginia the Jackson and Pedro Well was sunk to the depth of 587 feet, when a reservoir of oil was struck, from which flowed at first 1,000 barrels of oil daily, of a fine illuminating quality. Another on the Horse-neck Creek yielded an equal quantity for a short time, but fell off. The Gillfillen Well, on the same stream, 250 feet deep, gave 500 barrels daily, another 700, and many others on the Canawha yielded from 25 to 1,000 barrels. The Ohio oil-region has not hitherto been much explored, but it is beginning to attract attention. The New York and Ohio Petroleum Company has recently purchased about 3,000 acres, and have begun sinking wells upon it. So important and established have these companies become, that an agency for those in Pennsylvania named the Connate, the Cybele, the Ceres, the Themis, the Astrea, and the Nemesis combined, has been appointed in France (Paris), the announcement of which sets forth that 26 millions of francs of capital is to be invested in them, and 12,000 acres of land have been purchased on their united account in the oil region.

The depth to which these wells have at present been sunk or bored is from 100 to 1,100 feet; but there is reason to think that, at a much greater depth, there is a reservoir of petroleum, compared with which the quantities hitherto obtained are but dribblets. How far this opinion may be borne out, remains to be seen. Certain it is that the deeper the engineers have gone, the greater has been the flow of the petroleum. In fact, it has only been by deep boring that a "flowing well" has been obtained, by striking a considerable reservoir or "vein" of oil. In most cases, however, the pressure of gas is not great enough to force up the oil, without the aid of a pump. Even those which flow vigorously for some weeks have in many cases declined in power of flowing, rendering the use of the pump necessary.

The mode of sinking a petroleum well is thus described by an American writer in Harper's Magazine: "After the spot has been decided upon, which is in most cases in the lower bottom-lands, a stake is driven into the ground at the spot where the bore is to be commenced. A derrick is built, from twelve to sixteen feet square at the base, and about forty feet in height, running to a point at the top. The engine-house is erected, and the necessary machinery made ready within. Sections of iron pipe, six inches in diameter, are then driven into the ground by means of a pile-driver, until the first layer of rock is reached, which, in most cases, is found at the depth of thirty-five or forty feet below the surface of the ground. Great care is taken that this iron pipe is driven plumb. After the rock is reached, and the earth in the pipe removed, a block-and-tackle is rigged at the top of the derrick, and the drilling-tools, weighing in some cases 900 lbs., are hoisted up and dropped into the driving-pipe down to the rock. A temper-screw is then attached to the top of the drill by means of a rope, and made fast to the end of a walking-beam. This is a heavy horizontal piece of timber, supported in the centre by a Samson-post. The other end of the walking-beam is connected with the driving-pulley by means of a crank. The engine drives the pulley, the end of the walking-beam rises and falls; and thus the drill is raised or lowered at will. At intervals, during the process of drilling, a tool, called a 'reamer,' is inserted in the well, and the bore is increased to the proper size. A 'sand-pump' is a metal case from five to ten feet in length, constructed with a valve at the bottom. This sand-pump is lowered into the well at intervals, and when it reaches the bottom the valve opens and admits the borings, and when the pump is raised the valve closes, and the contents are brought to the surface. After the

bore is thus cleansed, the drill is once more inserted and the drilling is continued." A journal is kept, showing the different kinds of rock and earth passed through, and the exact points where watercourses, gas, or shows of oil are found. If a large vein of oil is struck, the well is immediately tubed with a 2 or 2½ inch iron pipe, put together in sections. The trucks or tubs that receive the oil are mostly of wooden staves, and are placed at some distance from the well, but are connected with the pump by an iron tube attached to the spout, conveying the oil to the tank. The expense of sinking a well ranges from 2 to 3½ dollars per foot. A well complete, including all necessities, is estimated to cost between five and six thousand dollars."

The largest flow of oil has been obtained by sinking below the third sandstone, which, however, is found at various depths, and, in some instances, has not been reached at all. It is supposed that the "great basins" lie at the depth of from 1,500 to 3,000 feet, at which a perennial supply, it is supposed, would continue to flow. It is the opinion of geologists that the formation of petroleum is constantly going on in the laboratories of nature, and that immense quantities of carburetted hydrogen gas, which accompanies the oil, are evolved in its formation; and that were it not constantly forming, the escape of that which exists would soon exhaust the supply, by which the pressure no longer operates to produce the flowing wells. Every theory, however, relating to the interior of the earth below the depth already reached is mere conjecture, founded, it is true, on analogy and observation, but liable to be upset by actual experience. One thing appears to be established to a certainty—that the basis of petroleum is coal;

and, probably, coal of a certain description differing from that which is found in England generally, because no petroleum is procured in any of our northern coalpits, although sunk to a much greater depth than any of the oil mills in America. It is, we think, probably the product of a species of coal richer in oleaginous or other inflammable matters than common coal more tender, and more easily acted upon by the natural heat of the earth, by which it becomes semi-liquified. This supposition is founded upon the fact that in New Brunswick, previous to the discoveries of petroleum in Pennsylvania, a company was formed for the purpose of distilling oil from *cannel coal*, which is found in that province in great abundance. This species of coal answers the description we suppose to be applicable to that from which the petroleum of Pennsylvania and other of the United States is produced. The "New Brunswick Oil-works Company," as the establishment is called, was conducted with great success, until the discoveries in the United States; after which, as the New Brunswick oil was obtained by distillation direct from the coal, it could not for the moment withstand the competition. Latterly, however, the works have been resumed with great credit and success. We happen to know this from the circumstance that a relative of our own, who held a number of shares, which he had laid aside amongst his bad debts, has recently and most unexpectedly received a handsome dividend upon them. We have referred to this case as pointing to cannel coal, which is the most inflammable species of that mineral we are acquainted with, as at least possessing a large share of those properties requisite for the production of petroleum.

THE OLD NORFOLK FARMER.

## THE ESSEX STEAM PLOUGH;

OR,

### OSBORN'S SYSTEM OF RIGGER HAULAGE.

Justice has been but somewhat tardily meted out to our West India planters M'Rae and Osborn, for what they have done in advancing the cause of steam culture. This we believe mainly arises from the fact that the propositions of both patentees were differently reduced to practice from what they are described and illustrated in their specifications and drawings. On entering the experimental grounds, the former (M'Rae) found that his project was subject to many cardinal alterations before it came up to the demands of practice, and as soon as these improvements were made, and their efficacy tested in the field, his engine and implement were immediately shipped from Glasgow to British Guiana. The other's (Osborn's) engines, &c., were shipped from London under somewhat similar circumstances; so that the British farmer Scotch and English, hardly had time to ruminate on what, some few of their numbers only had imperfectly seen; consequently neither could arrive at a practical conclusion. Indeed, so slight and imperfect were the impressions left upon the public mind in both cases, as to the mechanical details of the two implements, and methods of hauling, that almost every vestige of them was obliterated before the Chelmsford Meeting of 1856, when steam ploughing was for the second time introduced into Essex. At this latter period (1856) it was acknowledged one of the greatest modern improvements, in the estimation not only of the competitors for the prize offered by the Royal Agricultural Society of England, but also of the generality of spectators; but so completely was the former effaced, that hardly a single individual was present who could give any mechanical account of the first steam plough, all that remained being a faint recollection that something of the kind had been made; but its inventor, construction, and merits were questions upon which not a shadow existed in 1856 capable of leading to their practical solution. Fortunately the Glasgow and London newspapers recorded at the time the trial, experiments made, and also the manufacturers of the engines, &c., and to these sources we can yet apply for information.

The report referred to above, relative to Osborn's steam plough, will be found in the *Mining Journal* of October 14, 1848, page 486, from which it is quoted in the January num-

ber of the *Farmer's Magazine* for 1849, pp. 47 and 48. Both reports are illustrated, showing the rigger method of haulage. There were two engines in the system. These were manufactured by Mr. Wm. Curwood, engineer, Whitechapel; and the experimental trials were made on the farm of Mr. Tyler, near Stratford, Essex.

Osborn's method of haulage is on the rigger principle, as previously carried out by the other West India example (M'Rae's), and subsequently by the late Mr. Fowler, but differing in the details of mechanism from either; and also from the prior examples of Pratt, 1810; Chapman and Chapman, 1812; Saxton, 1832; Pinkus, 1839; Claussen, 1846; and those of a subsequent date, viz., Beadon and Smith, 1847; Sir J. S. Lillie, 1847; Arnoux, 1853; and Fiskén and Fiskén, 1855.

Osborn's tackle consisted of two vertical-grooved riggers working in framing fixed by straps to the side of the boiler plate, the one over the other, so that in going round these the wire rope formed the figure 8. From the bottom of the lower rigger the two portions of the rope were taken off tangentially by means of two small horizontal pulleys or friction wheels, and from which they passed to the opposite engine, or to an anchored snatch-block at the opposite headland, where only one engine was used, and at any desired angle required, the two ends of the wire rope being attached to the implement between, or the four ends of the two ropes to two implements between, where two engines and two implements were used. Motion was communicated to the lower rigger by means of gearing from the end of the crank shaft, which latter was situated below the boiler.

There were two engines of 10-horse power each, with vertical cylinders housed in the smoke box, motion being communicated to the crank shafts below the boilers, on the old plan of beams and side rods. They were rendered self-locomotive by means of "stubb-wheels and chains connecting them with the crank-shaft."

The trial experiments on Mr. Tyler's farm were made both with two engines, the one opposite the other, and also with one engine, the rope passing round an anchored snatch-block at the headland opposite. The distance between the canals in

British Guiana, where the engines were intended to work, being only from 240 feet to 360 feet, they in the first trial were only placed 120 yards asunder; but in subsequent trials this distance between them was increased to 210 yards, and also between the single engine and anchored pulley. The implements used were one of Lowcock's two-way ploughs, a Kentish turn-wrest, and an Essex two-wheeled plough.

The first trial with a Lowcock plough is reported a failure, owing to the draught not being adapted for steam power; but the second and subsequent trials are acknowledged successful. At this time, Osborn's own implements, those covered by his patent, do not appear to have been made: at least no notice is taken of them in the report. In point of fact, the two long implements specified as designed for crossing the open ditches in the low-lying plantation grounds of British Guiana were not suited for the land in Essex—a very good reason for not bringing them to the trial ground; and the other implement specified by Osborn appears as if it were the one at that time in use by Alexander M'Rae, Esq., on his plantation, and noticed by Leonard Wray, Esq., in his "Sugar Planter's Guide," published by Smith and Elder, Cornhill, in 1848, or before Osborn's experiments were made as above.

Such is a general outline of the first experiment of steam ploughing in Essex, and although highly successful and satisfactory in one sense, it nevertheless neither does justice to the subject nor Osborn's system of steam culture. In point of mechanism, as a question of science in the march of improvement, there is something so mysterious about the latter, Osborn's system of steam culture, that it requires clearing up, for the reporter to the *Mining Journal* states, doubtless on the authority of the patentee then in London, and no doubt present at the trial, that "the mode for taking up the wire rope constitutes the patent," i. e., the rigger system of haulage; whereas in the specification and claims of the patentee, not a word is said about rigger haulage; on the contrary, two vertical winding drums are specified in the letterpress, and delineated in the drawings. Thus, quoting from the Patent Office "Abridgments of Specifications," "each engine carries two drums on the side nearest to the other engine, and to these drums are attached chains or ropes, by which two four-wheeled carriages, fitted with ploughs or other implements, are simultaneously drawn across the field in opposite directions, each carriage pulling after it the rope or chain by which it is to be drawn back again. Thus, while one drum on each engine is at work winding up its rope, and so putting the ploughs or other implements in motion, the other drum is delivering out its rope in readiness for the return operation."

Inventors, when they enter the Patent Office, sometimes find themselves anticipated in part of their discoveries; at other times, different projects are so similar in character that they are obliged either to confine their claims within a narrower compass than they had intended, or else to allow prior applicants to "specify out" before they give in their final claims, which sometimes necessitates a second patent. This was more especially the case under the old patent law, which allowed a wider field to grasping claimants than the present statute does. Something of this kind appears to have been experienced by both M'Rae and Osborn. In other words, they had each two ways of carrying out their projects, but were obliged to confine their claims to one, leaving the other for a second patent, provided it was not included in the claims of a prior patentee. Indeed, on the part of Osborn this is manifest, for we find his patent-agents took out a patent of the same date as his own for a plan of rigger haulage, Clausen's patent No. 11,303 and Osborn's patent No. 11,304 being both dated July 23rd, 1846, and taken out by the Messrs. Robertson and Brooman, 166, Fleet-street. There is something so singularly interesting in this, more especially when Clausen's specifications and drawings are examined and compared with Osborn's project as reduced to practice, that we have thought it worth while drawing the reader's special attention to it, as a question in the march of progress in connection with the working and operation of our Patent Laws; for had it not been for the extra expense, Osborn would doubtless have had a second patent; and unreasonable as the expense of patents then was, it is probable that he would have secured the whole of his project by a second patent had he received greater encouragement so to do from English farmers, canal owners, &c. Hence the *rationale* of the statement in the report of the *Mining Journal* already quoted, for the claims in the second patent would have then

been those referred to, viz., "the rigger system of haulage," or "the mode of taking up the wire rope" as applied to steam culture, and canal and road haulage.

But be these hypotheses, contained in the preceding paragraph, as they may, one thing is manifest, viz., that to Osborn belongs the merit of having first reduced to practice the plan of putting the rope round the riggers in the form of the figure "8," so as to give it bite, and avoid the excessive abrasion and wear and wear upon it experienced under the other West India rigger system, that of M'Rae, who put his rope twice, or a sufficient number of times, round the barrel of his rigger to make it bite. The objections to this latter system of yoking the wire rope are too manifest to require pointing out, as are also those of the former, but the odds are greatly in favour of Osborn's plan.

In the construction of his riggers and friction pulleys it must be observed that Osborn fell into an egregious mistake, one into which all his successors who have adopted the rigger principle of haulage have fallen, viz., that of making them of too small a diameter: the former (the riggers) being only 3 inches. This may be pardonable in the outset, but it is the utmost that can be pleaded even in behalf of a practical man. It was doubtless much against the success of the trial experiments made on Mr. Tyler's farm, and still more against the durability of the wire rope under continuous use in British Guiana. But mistakes of this kind, although they often militate greatly against the successful introduction of a new project, only apply to the construction, and not to the principle upon which any peculiar mechanism is based. The report of the trial experiments made in the mother-country speaks favourably both as to the bite of the rope upon the riggers, and its general freedom from abrasion; the fact that the experiments were most successfully made when working with the greatest length of rope is conclusive under the former head—bite: while the tangential method of taking off and leading on the rope from and upon the vertical riggers by two horizontal friction wheels, was calculated to reduce the amount of abrasion to a minimum. In this latter respect we aver Osborn's system of friction wheels or riggers is freer from objection than any of his successors' methods that have yet been reduced to practice.

It also appears, from the report of the *Mining Journal*, that Mr. Osborn contemplated steam haulage both in the canals of British Guiana and also on land, by working his rigger system along an anchored wire-rope. In the former, canal haulage, this would be effected simply by placing his engine longitudinally in a punt. According to the report, two wire ropes were to be anchored in the canal, one on each side for the up and down traffic, the two engines in the two punts thus acting as two steam tugs, each hauling a fleet of barges after it, the one fleet on the right side, and the other on the left side, the two plying in opposite directions. In the latter case, rigger traction on land would be performed on similar principles, as the engine, in working itself along an anchored rope, would haul two or more waggons after it, the principle being similar to Chapman's plan.

Although in both these propositions Osborn was anticipated by prior patentees, in a manner which he probably was not aware of when he applied to his patent-agents in London, yet his plan involves improvements upon them which might have been patented after one of them, viz., Clausen's already referred to, had been specified and out of the way. This, at the time his engines were manufactured, was the case, the ground then being clear; and it is possible, as formerly hinted, that a second patent would have been applied for had he received in this country sufficient encouragement from farmers and canal owners to justify the heavy expense which patents then incurred. But at that time the agricultural mind was looking in a different direction for the practical solution of the problem of steam culture, i. e., rotary action, while the general body of the public was literally "railway mad," and bent upon filling up every canal in the kingdom with the least possible delay. Hence the upshot, no second patent, and only but a faint recollection left of Osborn's method of rigger haulage, there being not one in a thousand who knew anything about it at the Chelmsford meeting of the Royal Agricultural Society in 1856. His plan of using two engines also merits special notice, for although the mode described in his specification is the working of two implements on the old ridge and fallow system, yet he also specifies the working of one-way implements, which anticipates some of our modern discoveries.



## CATTLE VERSUS CORN AND MALT.

At a late meeting of the Dorchester Farmers' Club, the following lecture was delivered by Mr. DAMEN:—In introducing the subject this evening, I cannot but fear that I shall not interest you to the extent I should wish to do upon occasions of this kind, but I am sure you will take the will for the deed. The subject of my lecture is "Cattle versus Corn and Malt." In the first place it may be supposed that I should attempt to show the relative advantages of feeding cattle and of growing corn; but such is not my intention for a moment. It would be presumptuous on my part, in the presence of so many practical men, to attempt to prove that you could gain more by one system than another, therefore I shall not argue the question in this way. I shall rather demonstrate to you the fallacy of the advice given by many people—members of Parliament and others—at agricultural meetings, and indeed by all classes of the community, since the advent of free trade, that it would be desirable for you to fatten cattle instead of growing corn. It is my wish to show you that the effect of acting upon such advice would not be at all to your interest or to the general advantage of the people. And first, I believe, the price of meat, if you acted on that principle, would be so reduced that you would fail in the object you had in view. Therefore I am anxious to show you that it would be a mistake to follow such advice. I must endeavour afterwards to point out to you that it is more the duty of county members to support your interests in the House of Commons than to give suggestions of that kind. Especially, gentlemen, shall I show you in the latter part of my remarks that in reference to the malt tax their duty towards you is quite of a different character. You are all aware that in the advice they offer you from time to time they cannot understand as well as you yourselves that respecting your individual pursuits you should be better judges than they as to whether or not it would be preferable to fatten cattle rather than to grow corn. I desire in the first place to draw your attention to some remarks of a gentleman who is an eminent member of an adjoining county—Sir Lawrence Palk, in Devonshire, who, after making a good speech, said, "The long and short of what I would impress on the agriculturists is that they must look for the future more to producing good beef and mutton than to growing cereal crops." Now, gentlemen, you know, as men of business, that price must depend upon supply and demand. If you produce a larger quantity, price must lower in consequence. The price of meat for some years past, as you are aware, has been, as I may say, the sheet anchor of the farmer. But, gentlemen, the demand has been met by the producers of meat. Although the price has been high, and I admit has been remunerative, it has been met by you; for we must not forget the expensive means that have been used in fattening those cattle, and those enterprising men who have done so have only met a fair return for it. I wish, therefore, to show you, if the advice of Sir Lawrence Palk and other gentlemen could be acted upon, what would be the effect. The answer seems to me to be a common-sense one. The price of meat must be reduced, and that to the extent of say 1d. or 2d. per lb. I believe myself most firmly that it would convert the present fair profit into a positive loss (I hear, hear). Some have contended that the increased supply would be met by increased consumption; but it is quite evident that unless you can reduce the price of meat you cannot increase the consumption—not in an equal ratio, to say the least of it. And not only that, the price of meat must be governed by the consuming capabilities of the people. If it was possible, for instance, to get meat up to 1s. per lb., I would ask you if the great price would not in a very short time be reduced in consequence of people not being able to buy meat at such a rate? Therefore, in occasioning less consumption, the case would cure itself. We know, too, that if it were possible to raise the wages of the labourers and artisans of this country to the extent of twenty-five or thirty per cent., it is quite possible the price of meat, butter, and cheese would rise in proportion, and wages would rise in proportion; but wages, like everything else, are a marketable article, and you cannot raise the price of wages with

any view to their being marketable articles. Therefore it would take years to increase the price of wages. I have no doubt myself that in the course of years wages will so advance in this country, if we continue prosperous, that the price of meat and produce will increase in value in proportion as wages increase; for you will find the artisan-labouring classes of this country do not work to save, but to live, and live well if they can. Therefore it is only a question of time, but it must be a long time before any revolution of that kind can take place. In reference to the price of meat, let me call your attention to the report of a committee of the House of Commons that sat in 1834 or 1835 to inquire into the agricultural distress at that time prevailing. Before that committee some eminent farmers—some of the best in the eastern counties—gave evidence, and their evidence went to show that they were in the habit of stall-feeding largely, but that they had to meet a loss on the animals they sold. Their evidence was corroborated fully by each other that the loss on these animals so fed amounted to £1 or £2 per head each, and they gave them roots into the bargain. This was at a time when meat was only 6d. per lb. You will agree with me that in fattening meat at 6d. per lb. your loss would be something like it, but you would sacrifice your roots also in feeding animals. But these gentlemen contended that, notwithstanding the loss they sustained on feeding the animals to supply the markets at such a price, they regained their profit by what they called the value of the "muck" or manure which they produced. Now, gentlemen, muck of itself will not pay rent, however pretty the muck that can be made of it. Fattening must be followed by corn. Every practical farmer knows the necessity of a rotation of crops. Growing roots alone (as many contend we should) could never repay him. You cannot afford to sacrifice—as the Norfolk farmer contended he could do—his crops for the sake of the corn and muck that was to follow them, for that, as reasonable men, you know, must depend upon the value of the produce hereafter. Now, gentlemen, let me endeavour to show you the effect of depending on foreign supplies of corn to feed the masses of this populous country. I must first call your attention to the relative supplies of foreign and British produce. Since free trade became the law of this country, during the first twelve years we imported, in round numbers, about 5,000,000 qrs. of wheat per annum. But from 1860 (when the worst crops were grown in England that had been known for a half century) to 1863 we imported 10,000,000 qrs. of wheat per annum, or about sufficient to feed half the population of this country. It is strange to say, too, that during those years prices were reduced, and went down 25 per cent.; but this, I believe, was more in consequence of the American war than from any other cause. They sent us their corn as being the only country which could receive it and pay them their money, and from the effect of their own necessities. But, gentlemen, I shall now suppose, for instance, that we should unfortunately be engaged in a war with that country, and that the supply of corn should cease. What would be the consequences? If we should be, as well, engaged in a war with our near neighbour—that great naval and military country—what would be the effect on the price of corn? People argue that war has ceased—that we are so civilized that war is almost impossible. But the history of the past is the best criterion for the future. You will find we have had before as long an interval of peace, and it was followed by war. As an Englishman, I cannot help looking with some alarm at the great preparations for war which are now being made in this and other countries. Sooner or later war must come, therefore I believe most sincerely it is the duty of a paternal government to protect agriculture, and do all they possibly can to promote the growth of food for the people of this country; because, whenever war comes—for come it will, God knows how soon—the greatest question of the day will be, the feeding question—the feeding of the people. If we have depended on foreign countries for one quarter or one-half of the food of the people, I would say this—that it is the absolute duty of the Legislature to promote in every possible way this branch of agriculture. We all



know, gentlemen, what effect war has upon price; for only in the years 1851-53, during the time of the Russian war—when too we had good crops—prices advanced as far as 80s. to 85s. per quarter, just double those at present, and this whilst we had good crops at home, and this also at a time when we were fighting happily, not against, but with France—when France and England were mistresses of the seas of the world; when there was no one to compete with, and so far as regards our importations there was nothing whatever to prevent it. But even at that time, with good root crops, wheat was selling at 80s. to 85s. per quarter. What would be the effect in the event of a great war unfortunately rising? It may happen that that greater country may fight against us, instead of with us. Therefore, again I say it is the positive duty of the Legislature of this country to protect and encourage the home produce of the British agriculturist. This, gentlemen, I do not argue more for the sake of the farmer alone than for the community at large. It is a national question, and I do not urge it for the sake of the pecuniary advantage which may arise to the agriculturist; but the supply of the people generally with food of home produce is the main question. Gentlemen, one word with regard to the effect upon agricultural labour, if this insane advice, as I may call it, should be followed. If the foreigner is to feed the people of this country with their bread-food, if the system proposed by some men, not well informed on the subject, should be adopted, that we should almost entirely grow roots instead of corn—which I don't believe possible—the next thing must be that tillage land must be converted into pasturage. Then, I ask, what would be the effect on that deserving class, the agricultural labourer? We all know as practical men that every 100 acres of arable land will find employment for four men. If you convert that land into pasture, one man will do the work of four; therefore, by such a system, you throw out of employment a vast number of men, and unjustly so. Gentlemen, I fear my remarks will now touch a little on politics, in this short address I am giving you—and it shall be very short I promise you. I have endeavoured to show the effect of following Sir L. Palk's advice in this matter: I wish now to show you what should be the duty of County Members upon this question, and with regard to your interests generally. In doing this I do not wish for a moment to leave out of the question the constituencies of county members—you yourselves, gentlemen, and your class generally, especially with regard to the duty your worthy chairman has enlarged upon—the Malt Tax. That forms part of my subject, and you will excuse my entering upon it. With men who have fully made up their minds, I do not intend to argue the question upon all its merits, as I should be wasting your time in doing so. I cannot, however, help saying this, with regard to it: That if any farmer has entertained misgivings previously, I think for the last two or three years he must have begun to see that our demands on that subject are just and reasonable. If he looks at the price of barley he will find that most unremunerative; he will find, however much he will grow, however much he may improve his soil, he will get no corresponding advantage from it. In growing malting barley, for instance; if he grows 20 or 30 less per cent. over the country, he would get a much larger price; but he does not get anything more from this extra quantity. So far as regards the grinding value of the barley, it is quite certain he cannot afford to grow it for grinding purposes. At this moment the inferior grinding barleys of Europe, and Turkey in Asia, can be brought into this country at a much less price than we can grow them. I would be prepared to supply any gentleman in this room grinding barley, weighing 50lbs. a bushel, at a guinea per quarter. I should be happy to take orders for 5,000 or 10,000 quarters of good grinding barley, at a guinea per quarter. If you get a large crop of barley in this country, the brewers positively get all the advantage. The public pay the same price for their beer, and not a farthing less (Hear, hear). If you get a large crop, people get the advantage of cheap bread, which is always a blessing; but whatever the crop of barley, the people never derive any advantage. It all goes into the capacious pocket of the brewer. I don't blame the brewers; but there it will continue to flow, unless you and your representatives in the House of Commons bestir yourselves to alter the system, and you should bestir yourselves to be represented as every other class of the community is represented. If you wish to get the repeal of this tax, don't be satisfied with your members

saying to the Chancellor of the Exchequer, "Oh, Mr. Chancellor, my constituents want the repeal of the Malt-tax, but don't inconvenience yourself about it. I meet them very seldom, only about once a year, at jolly agricultural dinners or at election times—don't inconvenience yourself about it. It is quite true you boasted, Mr. Chancellor, in your speech on the budget last year, that during the last nine years you have taken off taxation to the amount of nine millions a year. But my constituents say they have had no advantage, nothing worth mentioning; but rather their agricultural burdens have increased. I don't know whether 'tis a fact or not, but they say so." That is what such a member would say. Now, gentlemen, I think it is time for you to bestir yourselves and say whether this is fair or not. It is time you should say, "You have taken the duties off tea, sugar, and wine, and paper; but I feel no interest in these things, except in a very small ratio, a very small degree indeed." But, gentlemen, it seems to me you want men, regardless of all party feeling, to demand justice at their hands. I would ask you, gentlemen, is the next great surplus to be frittered away in the same way? Are you to have no benefit from it? It is a question you have to ask yourselves, whether it shall be so or not. According to present appearances, there will be, as has been the case for some time, another great surplus to be disposed of. It will be frittered away as before amongst people that ask for it—amongst people that have the most influence with the Chancellor of the Exchequer and the Government of the day, whatsoever that government may be—this is a matter of course. As I have said before, I do not blame the members more than I blame their constituents respecting this matter. But I would ask you how Manchester would act under similar circumstances. Would they not put themselves in communication with their members; and if those members did not satisfactorily represent their opinions, would they not change them? Most assuredly, yes. But, gentlemen, at Manchester they have Chambers of Commerce. And it is a well-known fact that the Chamber of Commerce at Manchester carried Free Trade, and we give them credit for doing so; but where is the Chamber of Commerce for agriculture? what interest have you? How are you represented in these matters? Gentlemen, I am coming to the pith of the matter; I am coming to the postscript which contains the best part of the letter, as the ladies say. I would suggest, if not Chambers of Commerce, that we should have agricultural boards in this country; that we should put ourselves in communication with our representatives; because they themselves are quite at a loss to know what we require unless we tell them, and I believe no agricultural boards could be so easily formed as those formed by Farmers' Clubs. They are supposed to, and I believe do most thoroughly, represent the agricultural views of the districts in which they are formed. People may sneer and say, "I don't belong to one," but I say plainly they represent their views and opinions in these matters. I see this exemplified in every discussion that is introduced; indeed, I saw it at the last lecture that was so ably given in this room. Many men adopt the opinions enunciated here. Only lately a man said to me, "I shall not do so-and-so until I hear what the lecturer says on the subject." Therefore, however much individuals may keep aloof, and always will keep (for we cannot all be of the same opinion), that we do represent the agricultural opinions in our clubs and districts, I have no doubt whatever; and that we shall continue to do so I have no doubt. And if we are in that position I would ask if we cannot go further, and put ourselves, as time and occasion may require, in communication with our members, and let them know what we want. I believe they would be satisfied equally with ourselves; but they are kept, as a rule—as we should be without such societies as these—in darkness as to our views, because they only get our views and opinions at the after-dinner meeting of some agricultural society; and it is a mere nothing they can get there, whilst we, as agricultural clubs, represent those opinions, and can tell our members what we mean. In speaking of politics, I would say that as regards party politics, I have been a member of various farmers' clubs for a great many years, but I must say that I never heard any subject introduced of a party nature. I believe we have scrupulously avoided party politics, and therefore we have no reason to be afraid of expressing our opinions fearlessly on all subjects that relate to agricultural politics. I know the fashion of the day, gentlemen, is, in a great measure, to ignore

agricultural claims. I do not know why, but such is the case. In the House of Commons, and out of it, we seem to have lost our interest in the body-politic of this country. I believe it most firmly that we have. I would not say the manufacturing interest has no claims: it has exercised its wisdom, I will call it, in advancing its own claims and objects before the powers that be in this country. They have indeed been heard, whilst we have not, however just our claims may have been; but this is no reason why we should not insist upon justice on our side: we ask for nothing more. You are aware that in France, gentlemen, the Government seems especially to take care of its agricultural interest—that they have a Minister especially devoted to the interests of its agriculture; and you may have seen, as I have seen within the last few days, a circular (and a very sensible one too) addressed to the people of France in reference to agriculture. The agriculturists of France complain that prices are so low that they are losing their money; and you know if men lose their money they squeak, in any part of the world. They blame their legislature first, in a very sensible way. This Minister of Agriculture replies, "It is not so. It may be from your good crops, or the good crops of England. The facts with regard to France are these—that they only import, and have imported within the last two or three years of these low prices, three per cent. of their consumption; but then they have in the same time exported more than they have imported." But, gentlemen, in this country the case is entirely different. As I have shown you, we import from one-quarter to one-half of our consumption—the bread of the people of this country. The large importation ought to be sufficient to satisfy any body of people that we are not in a safe position to import a larger quantity than this, especially, as I have said before, in the time of war, come when it may. I don't mention these large importations that we receive in this country for a moment with any view of wishing to reverse that system which has been established here, and firmly established within the last few years—free trade, I mean. Neither do we want, as I know of, a Minister of Agriculture here; but we want freedom to grow, untaxed, the natural products of our own soil. The manufacturers argue, and with irresistible reason too, that, from various circumstances in this beautiful island of ours, with its enterprising people, we are adapted to manufacture for the world, with all our advantages of coal and iron, which tend to make this country so great, and we ought to become a great manufacturing people. Therefore, with this irresistible argument, they obtained free trade; and, it appears, rightly too; for you don't find a single man who wishes to reverse this principle: whatever the feelings of individuals may be, it is of no use. It is a matter of fact; and facts are stubborn things, as you all know, you can't contend against. It has become the law of the country, and you cannot resist it; but whilst you give the manufacturers this privilege, if I may so call it, you at the same time have a right to say, "We in the country demand free trade—we demand free trade for the growth of one of our great productions (if not so great as wheat)—barley." We say, "If you are adapted, you of Manchester and you of the North of England, to be the manufacturers of the world, we as agriculturists can say, in all fairness we are entitled to produce what the soil and climate of this country are eminently and peculiarly adapted for; and why put a restraint upon our productions, if you untax yours?" We only say it in fairness; we ask no favour. I believe it is perfectly absurd to say that any favour is asked; for it is only a matter of justice we ask, like the rest of Englishmen. When we say we want no favour, we have been told "You have got some little favours." And what are they? I believe one of the greatest of these privileges is that our shepherd's dog is allowed to jog along free of tax: the rest is, I believe, that the farmer, his master, saves about the same in having no duty to pay upon his fire insurance. These are our many privileges. We never asked for them, and we don't want them: we only want to be put in the same position as the rest of the community. It is difficult to understand how such legislation could have taken place. I can only fancy it must have been done at a lax time of the session, in the dog-days. I once happened to be in the House of Commons in the dog-days, and there I saw one of the senators lying on his back at full-length, and his hat upon his face, just in the same way as you see a lazy hind in a hay-field. It must have been at some such time the legislation took place about the shepherd's dog. We want nothing of the kind: we want fairness. We would

say to the people of Manchester, or wherever free-traders may be, "Don't keep it all to yourselves. Don't let your sympathies run all in favour of foreign producers." They say, charity should begin at home; and I would say, let justice find a resting-place there as well. Gentlemen, I don't mean to detain you much longer. I trust I have said enough to show the fallacy of substituting the fattening of cattle for the growth of corn in this country; and if we left that principle, how dangerous it would be in case of war, not only to the growers of corn, but to the community at large. I trust I have thrown out a hint with regard to your duties respecting your agricultural members, that there should be a source opened up whereby you may in some way or other communicate with them from time to time, and that your opinions should be as thoroughly represented to the House of Commons as every class of the community is represented. This, I am sure, is due to you; and if you only demand it as your right, as Englishmen, in a just cause, you are sure to get it.

Mr. J. G. HOMER agreed with Mr. Dams that the right principle to go upon was to combine the production of stock with the growth of corn. Indeed, he did not see how a great portion of this country was adapted to the production of meat alone. On their hill farms, it certainly would not answer, though there was some land that could perhaps be turned to better account in pasture than corn at the present price. But suppose they were to give up growing corn, as Mr. Bright advised them many years ago in this town, the consequence would be that the supply of the necessities of the people would be left entirely to foreigners, and prices would soon have an upward tendency; for he was informed that, according to quality, ours was now the lowest market, with all our foreign imports. The price of meat must be governed, in a great measure, by the price of corn. Supposing they were left without a root crop, or only half a root crop, and corn was very dear, what remuneration could they get with the cake so high for the feeding, at present prices of beef and mutton? None whatever. But, with the low price of corn, they were able to feed with remuneration. With regard to the malt-tax they only wanted fair-play. The Legislature thought they had given the farmers a great boon by allowing them to malt for feeding purposes; but there were so many restrictions that it could not be done. He believed it would be a great advantage if they could have malt to mix with other things, and that if they were unfettered in this respect they would be able to produce more meat than they did at present.

Mr. J. GALPIN was called upon by the chairman, and said he dissented from one portion of Mr. Dams's remarks. He stated that not only in the House of Commons but out of doors there seemed a disposition not to do justice to the agricultural interest. He of course could not speak for the House of Commons, but on the part of those out of doors he entirely dissented from that opinion. For his own part he thought too much political matters had been discussed at these clubs. That was his individual opinion, and he knew it would not be received with approval by the members present. He was one of those who wished to avoid going into such subjects, and whatever he thought himself he desired to accord the same privilege to others. He, however, trusted the day would be far distant before they saw Mr. Dams merely delegated from an agricultural body or any other body to support individual interest, but that they would be allowed to exercise their judgment as honest and upright men for the good of the community at large. It would be an unfortunate thing if they made anything a question of agriculturists against manufacturers; and he did not think any one would feel it to his interest to advance anything injurious to the agricultural interest.

The CHAIRMAN understood Mr. Galpin to draw a distinction between the feeling out of the House of Commons and within the House. He said nothing about the latter.

MR. DAMEN thanked the chairman. That was a good distinction.

Mr. GALPIN said he confined his observations to the out-of-doors part.

Mr. T. H. SAUNDERS offered a few remarks in support of what had been advanced by Mr. Dams and Mr. Homer. He also observed that on arable farms the stock cost them quite as much as they got for it, or double as much as where they had good deep grass land; but then they must manage according to the soil and the climate, and could not in many districts pay attention solely to stock. As to barley, if Mr. Dams

could supply good grinding samples at the price he had mentioned, it was impossible to grow it here, and leave any rent for the landlord.

Mr. H. DUKE said his opinion was that the more stock they kept the more corn they could grow. In some localities the land was naturally arable, and in others it was naturally pasture. Within the twenty years he had been in this county one-third of the land had been broken up; and he thought there was an opportunity of keeping stock to a much greater value than when it was laid down. There was one thing which he would mention, and which they heard very little of at farmers' clubs, or when they were going to take the lease of a farm, which was the climate of the country. He believed in this county they had as good a staple of land as in most counties, but the climate was very much worse. If they only went a very little distance, say between Christchurch and Southampton or Portsmouth, he was satisfied that there a man would produce stock with much more profit and more weight with roots alone in ordinary seasons than they could here with all the roots and corn they could give them. This was a great consideration when a man was taking a farm, and he estimated that 5s. an acre would go a very little way towards it. He believed there was more stock bred in this county than twenty years ago; but he considered it a great question whether a larger amount of meat was produced, and he would tell them why. In the market that day he saw a lot of sheep sold weighing about 7 stone, which, with a little extra keep, would have made 10 stone. They would have well paid the expense of keeping a little longer; and stock was often sold just at the time they were beginning to pay the farmer. Thus the amount of produce was reduced, and the population of the country were the losers. It was from facts like these that he was led to doubt whether more meat was now produced than a few years ago. They were obliged to keep their corn till it came to perfection, but not so with their stock, and hence the low price of the one and the high price of the other.

Mr. G. W. HOMER observed that they had been recommended to grow more turnips, but he was inclined to think they were the most expensive crop grown, although a portion was necessary, because it was the best crop under which the land was cleaned. A gentleman of considerable experience informed him that he found his turnip crop cost him in growing about £4 an acre, and that the produce from it was but £2—this under the ordinary system of keeping a flock of sheep upon them. That at first sight might appear rather startling; but when they considered the large breadth of land over which sheep went, the clovers and turnips, and the produce of the permanent pasture meadows which they consumed, it was a question whether his estimate was not a sound one. Now, he thought the growing of more cereals and pulse crops, and feeding them on the land, would pay better than turnips. On light land they might sow an early description of pea, and by being cut rather before ripe, it might be followed by a crop of rape, previous to spring corn. On heavy land beans might be substituted, which would be better food than turnips. As to the question of the malt-tax, at the present time they were bringing their untaxed cider in this county from Devonshire at about 10s. a hoghead, whilst the tax upon malt liquor was about 11s. a hoghead.

Mr. DAMEN, in reply, said he had very little to offer, as most of the discussion supported the views he had propounded. With respect to the observations of his excellent friend Mr. Galpin, he did not for one moment suspect that there could be any feeling whatever against the agricultural body in this

neighbourhood; but he did contend that their interests had been somewhat neglected or passed over in the House of Commons for some years past. If they looked into it, they would find that the representatives of the agricultural interest had not had that weight in years past which they might expect under the system of free trade. He would refer to the Malt-tax, and he must say on that question the agriculturists had not had justice done them. He did not wish to put it in any party spirit; but as they had free trade in corn they now asked for free trade in barley. He did not wish to see any rival feeling created between town and country, manufacturer and agriculturist; but he wished to see justice done to the one as well as the other.

The CHAIRMAN, in closing the discussion, observed that with reference to the question of introducing politics in clubs of this kind, he must say he entirely differed from Mr. Galpin, with this condition, that it was with agricultural politics they had to do. These he considered lay strictly within their province; and he could not sit as a member of the club, more especially as their chairman, without insisting on that condition. They had to do with the agricultural politics of the country, confining themselves to those, and laying aside in fact all party politics; and he conceived that every member was free to go as fully as he liked into agricultural politics. This brought him to one observation of his friend Mr. Damen, as to the ignoring of the agricultural claims in the House of Commons. He thought Mr. Damen was right in what he had said, that there was an ignoring of the claims of agriculturists; and they could not take a better instance to show it than the Malt-tax. They had taken away protection to the British agriculturist, to which he assented for the sake of the common weal; but they claimed that equal justice should be done them. If they took away the protection of the English agriculturist in the growth of corn to the benefit of the foreign grower, surely they could not refuse to do justice to the English grower, by taking off a duty which pressed as a heavy tax upon an article which ranked second in importance of all that he grew. As to the fallacy of advising them to produce stock instead of growing corn, he need only refer to the practical experience of agriculturists, who need not be told which was the most profitable way of employing their land. The system which had been adopted for the last twenty years was the raising and production of as much stock as they could, and the growing of as much corn as they could; and he believed Mr. Duke was right when he said that both must go together in order to make a farm remunerative to the tenant. The larger quantity of corn they grew the more stock they kept; but he did not believe the increase in the amount of stock, even at the present price, balanced the loss they sustained by the loss of corn. Mr. Damen had alluded to the desirability of their having some means of official communication with their county members. All he could say upon that point was that they had a better means of communication now than before the establishment of these farmers' clubs. They might depend upon this that it had brought them into more direct contact with their county members than they had ever experienced before; and he rejoiced to know that this had been the case. But at the same time he did not see why an agricultural board should not exist in this country as well as commercial boards—the object being the protection and advancement of commerce in the one case, and the protection and advancement of agriculture in the other case.

A vote of thanks to Mr. Damen was then proposed by Mr. Homer, and seconded by Mr. Clements, and that gentlemen having responded, the proceedings terminated.

## THE ROYAL AGRICULTURAL SOCIETY OF IRELAND.

### THE CLONMEL SHOW.

Contrary to previous expectation, the Irish Royal for 1865 has been tolerably successful. It commenced with the judging on the morning of Wednesday, Aug. 16, winding up with a ball on Friday night; and the attendance through-

out was good. Of course, the Lord-Lieutenant was there, and delivered at the banquet on Wednesday an exceedingly practical speech, in which he strongly inculcated the doctrine of self-reliance on his audience, which, he very pro-

perly said, if disregarded they would never be able to remedy the evils under which the country suffered nor advance its prosperity.

The Shorthorn class numbered seventy-nine entries, of which very few were absent; and the aged bulls, which were turned out for the inspection of Messrs. Unthank and Garne, were a useful lot of animals. These gentlemen took for their first choice Mr. Moffat's White Chieftain—a good-handling, thick, short-legged bull, by Mr. Barcroft's Sir Colin, the great opponent in his show days of Dr. M'Hale. The next was of a different style, a massive, high-standing, wiry-haired bull, belonging to the Right Hon. Mr. Fitzpatrick, who had picked him up at the Newcastle Royal last year. Mr. Malcomson's Field Marshal 2nd, formerly Lord Waterford's show bull, came in for a high commend, his good fore-end making up, in the judges' opinion, for a very awkwardly-set pair of hind legs. There were also two commendations in this section, namely, Mr. Butler's Prince Imperial by the Fairsby Leviathan, which was a challenge-cup winner of the Royal Dublin Society; and Mr. Barcroft's Gray Friar by Dr. M'Hale, out of a Sir Samuel dam.

The first two-year-old bull, Felix, belonging to Mr. Wallis, though not a stylish animal, has lots of substance, and is an even bull, likely to get good stock. Last Easter, at Dublin, this bull was also first in the two-year-old section, when shown by his breeder, Mr. Jones, of Mullinabro. The second bull at Clonmel, Gwynne of Lothian, belonging to Mr. Massy, was by Lamp of Lothian out of Sweet Poll Gwynne by Duke of Cambridge (12747), and is a good-handling bull, with wide rib, but looking a little pinched-up in his gait when shown out. Mr. Cosby's Ravenswood, also of Lamp of Lothian blood, and which had been the best yearling of the Dublin Show last year, was highly commended.

The yearling bulls were headed by another of the Lamp of Lothian tribe, in Mr. E. J. Smith's massive Chief of Lothian; supported by Mr. Kearney's Son of Dr. McHale as second. This bull was shown in thin condition, which brought out his lightness behind the shoulder more than would have been the case if he had more flesh on him. Mr. H. Butler's Fenian, by Paterfamilias (18521) out of a cow of Holmes' blood, was commended.

There was a large turn-out in the baby-bull section, the two prizes in it being given to a pair shown by Mr. Anderson, Grace Dien, two very promising calves; and these left such a good lot behind them that the judges cleared off all scores by commending every one of them.

Mr. E. J. Smith, who appears likely to take up the place left vacant by the death of Capt. Ball, showed Capt. Ball's Recherche in the cow class, and won with her. Notwithstanding her frequent appearances in public, Recherche keeps a grand cow, and is not only a show animal, but a regular breeder. The second cow, Mr. Anderson's Dandelion, from Mr. Langston's herd, has a capital breast, and is also very good in her quarters. Mr. Barcroft's Mysic 19, a former winner, came in for the third place in the section; with commendations to Mr. Anderson's Flower of Rocklands, Sir John Keane's Silver, Mr. Malcomson's Knight of Windsor cow, and Lord Lisimore's Flirtation, bred by the late Capt. Ball.

Mr. Jones had his Lady Spencer, with her good breast and rib, in the three-year-old section, and won the first place with her, as he has done before; while Mr. Reynell's well-bred Princess of Wales was put second.

In the two-year-old heifers there were some capital beasts shown, and Mr. Massy's Woodbelle, bred by Capt. Ball, was put first. She has an immense chest and capital loin, but is getting rather gaudy behind. Sir

Robert Paul's very handsome Silk, with her sweet head, and beautiful run of neck, breast, and rib, was second, followed by commendations to the others.

There was a capital muster of yearlings, the judges fixing upon Mr. Anderson's nice handling Gamehen 2nd as first, with an exceedingly perfect heifer, Rosette, belonging to Mr. Welsted, as second. Mr. Meadows' Fanny 15th was highly commended, along with Mr. Welsted's Elfin Rose, which, like Rosette, was by Booth's Elfin King.

Three nice heifer calves were picked out for honours in that class, namely, Mr. Bloomfield's Medora, Mr. Anderson's Octavia 3rd, and Mr. E. J. Smith's Sunshine, which was the produce of his winning cow Recherche.

The other breeds, Herefords, Devons, Ayrshires, polled, and Keries were meagrely represented, and do not call for any special remarks. In the strictly tenant-farmers' section some good cows were shown, all of which proved the extent to which Shorthorn blood has been drawn upon for the improvement of the dairy stock of Ireland.

The horses were poor in point of quality, and served, in most cases, to illustrate the necessity for immediate and great improvement in this class of stock, rather than to show advancement. The Croker Cup, for the best thorough-bred weight-carrying stallion, was awarded for this season to Mr. M'Craith's bay horse Forager, by Cossack, dam by Liverpool.

The different classes of sheep were well represented, particularly Leicesters and Shropshire Downs. In the former Mr. Owen was the leading winner, obtaining the long-woolled Cup with his shearing ram; while the short-woolled Cup went to a Shropshire shearing ram, exhibited by Mrs. Smith Barry, who took most of the prizes in that department of the sheep classes. Mr. Hamilton was also a successful exhibitor of Shropshires. Mr. Marris, Lincolnshire, came out well with Leicesters and Southdowns, and Mr. Beale Browne with Cotswolds.

The show of Berkshires, in the swine class, was what one would expect in a district where pigs are not only a leading description of stock, but where Berkshires are the favourite breed. Messrs. Joyce and Malcomson were the most successful exhibitors of that description of pigs; and Mr. Wainman and Mr. Napier of white swine.

There was nothing striking in the poultry sections; and the other minor departments of the show, namely, butter and flax, were respectably filled.

The implement yard was not nearly so well supplied as it ought to have been; and it is alleged that the increasing indifference of manufacturers to exhibit arises from the want of that spirit of competition which is brought into play by trials of the different machines. Whether this view is correct or not, we cannot say; but certainly the entries of implements at the Irish shows are not increasing.

The following gentlemen officiated as judges:—

Shorthorns: Messrs. Unthank and Garne. Herefords and Devons: Messrs. T. Duckham and Cureton. Other breeds: Messrs. Mowbray, Guthrie, and Hilliard. Farm horses: Sir Percy Nugent, Major Burrows, and Mr. Darker. Thorough-breeds and hunters: Messrs. Boyd, Thurnell, and Clarke. Leicesters: Messrs. Painter, Warburton, and Thurnell. Downs and Shropshires: Messrs. Duckham, Cureton, and Thurnell. Swine: Messrs. Chaloner, Borthwick, and Fisher. Poultry: Messrs. Darker and Staunton. Butter: Messrs. Forde, McDonald, and Greene. Implements: Messrs. Borthwick, Wade, and Finlay.

## AGRICULTURAL EDUCATION.

## PUBLIC AND PRIVATE CHARITY SCHOOLS.

Under primitive and patriarchal times the gratuitous education of the rising generations by governments, chiefs of clans and tribes, and by wealthy patriarchs, had many things to commend it to the favourable attention of the general public; but the progress of science, and the subdivision of labour, through the instrumentality of the thousand-and-one chemical and mechanical appliances of modern times, which have split society into innumerable sections located over the face of the whole habitable globe, and yet all united by a common fraternal tie of industry, have changed this old educational policy, and substituted in its place one of independent action, whereby it has become the duty of every parent to educate his own children, failing which the children must educate themselves as they grow up to manhood. What was once the rule has now become the exception, the old policy being in a great measure reversed. The change which has thus taken place is no less interesting and instructive, when viewed in a social light, than it is when examined in an individual and industrial, as it shows the moral force and triumph of innate principle over expedience, so to speak, that manifests itself in the breast of mankind, struggling, as it were, to rise above their fallen condition to that common level from which they fell; or as Milton has beautifully portrayed it, in "Paradise Regained," only attainable at the further verge of Time. The change, however, is a work of progression, which at the present time is far from being complete; hence the mixed character of our colleges and other seminaries for education, both public and private, that exist in every division of the kingdom, or we may say throughout civilized Christendom, some being self-supporting, others being partially or wholly supported by Government, either by annual grants, or permanent endowments, or partly by both; and a third class being upheld by charity, either by annual subscriptions or otherwise, or by permanent endowments. A few practical examples will best illustrate the respective merits of these several plans in this concluding paper.

The self-supporting system, the first of these plans, is the one that merits special attention, as it is daily gaining ground in the estimation of the public, being free from many objections to which the others are subject. Its principle of action is that of merit, both teachers and taught having to rely upon their own exertions for their respective interests in the matter, the former for their incomes, and the latter for their pennyworth in the shape of education. If a schoolmaster is an industrious, successful teacher, his merits are appreciated in the locality where his school is situated; a large number of scholars collect, to benefit by his abilities; consequently he reaps a correspondingly large salary in fees. If he is, on the other hand, indolent and unsuccessful in his labours as an instructor of youth, the reverse is the case, few attending his schools, so that his income is correspondingly small. On the part of the boys, their position is of a somewhat similar character; for under a good teacher the yoke feels much lighter, their encouragement to make progress greater, and accordingly they advance in their education more rapidly, costing their parents less money and time for schooling of a superior kind than in the opposite case of a bad teacher, who invariably makes indolent, bad scholars, and an expensive education. In the former case a good education is obtained at a great economy of time and money; in the latter an inferior education at a sacrifice of both money and time. And the gains of the one and losses of the other extend to more than school-fees and the length of time spent at school; for they include also the board and clothing of the boys, and also the influence which these circumstances have upon their future welfare when they enter upon their apprenticeships as young farmers and labourers. In a practical light, therefore, the difference between the two, viz., a good and a bad teacher, is not very easily estimated.

It is not always the greatest scholar or the ablest man in science who makes the best and most successful teacher, more especially in the rudimentary branches of education. And

even in the lecture-room of the college, where a higher standard of scientific attainment is necessary than in the grammar-school, the more talented of two philosophers or learned men may not prove himself the most successful teacher. This arises from the fact that teaching the rising generation any branch of science, as agricultural chemistry or mechanics, is an art and not a science. It is not, for example, the science of agricultural chemistry, but the art of teaching that science; and it very frequently occurs that the most talented chemist or profound scholar in any other branch of science is remarkably deficient of the art of teaching. It is not very easy to describe the distinctive characteristics of the one in comparison with those of the other within the limited space at our disposal, but this is the less to be regretted inasmuch as our readers generally must be practically familiar with the facts of the case themselves, as actual examples everywhere abound which are publicly acknowledged.

It is upon a thorough practical knowledge of the art of teaching that the success of self-supporting schools depends. "The right man in the right place" has become a national proverb, and in no case is it more applicable than in the school and class-room. The truth of the proposition manifests itself in every example, from the infant-school up to the professor's chair of the college; and if it is more conspicuous under the self-supporting system, where teachers are entirely dependent on school fees for their incomes, than under the others, where their incomes are wholly or in part paid by Government, or are obtained from some other charitable source, it is partly because the right man fills the right place on the taskwork principle upon which the former system is founded, and partly because of the routine independence of teachers upon which the latter two systems are founded, together with the little value put upon gratuitous education by the taught, according to the proverb, "Easy got, little valued." It may be fallen humanity, but it is now the natural course of things, from which no section of society is excepted; the stimulus of merit, with its appropriate reward, being essentially necessary to industrial action in every art and branch of science and in every sphere of the industrial world.

Self-supporting schools are very differently constituted. Thus a teacher rents a house for an infant-school, grammar-school, or college, and takes in pupils, his income being entirely derived from fees—generally so much weekly, quarterly, or yearly. The whole responsibility of the concern rests upon himself: his merits as a teacher, for example, are known in the neighbourhood to parents, who enter into an agreement with him for the education of their children. In grammar-schools and colleges he may have a number of assistant teachers in his employment, but the principle of action is the same.

In other cases a number of parents join, rent a school, and engage a teacher, who undertakes the work for the school fees on specified terms. In this case the teacher is more or less under the inspection of his employers, but in other respects infant-schools, grammar-schools, and colleges are similar to the last or first example.

Again, not a few landowners build schools, and engage teachers, who undertake the work for the school fees, being less or more under the supervision of landowners, agents, or those whom they may appoint, as the minister and churchwardens of the parish, or the managers of a dissenting congregation, &c.

Again, self-supporting schools may be either day-schools or boarding-schools, but further into details under this or any of the above it will be unnecessary to go, as they are generally well known.

On the merits of Government or national schools and colleges much need not be said: at best they form a case of necessity, the existence of the least of two evils as it were. The principle on which they are founded, if principle it can be called, is analogous to the old oft-told story of "robbing Peter to pay Paul." The people are unable, for example, or think them-

selves unable, to raise the wind for the purposes of building schools and colleges, and of paying teachers for educating themselves, and therefore they apply to Government for annual grants or a round sum to cover a permanent endowment. And how does the Government raise the wind? Simply by taxing the people, and thus making them pay indirectly for educating themselves. We need not go further into detail to show the reader that as a question of principle the establishment of national schools will not bear a very close investigation. It is only as a question of expediency that their existence can be justified, and even when examined under this view the system is greatly more expensive and less efficient in its operation than the modern self-supporting one already noticed.

Necessity, however, is subject to no economical laws, and therefore Government must in many cases tax the whole community, or rather those who pay the taxes for grants and endowments. This is generally done for the ostensible purpose of erecting schools and colleges for furnishing a suitable education for those who are unable to educate their families as they ought to be educated, and in many cases such is actually the plain matter of fact. It is, however, otherwise in not a few examples, more especially schools and colleges for teaching science such as that of agriculture, for they are only adapted for the more wealthy classes of society, who are able to educate themselves. How few students are there, for example, at the universities of Oxford and Cambridge, whose parents are not well able to pay for their education on the self-supporting principle! and nearly the same thing may be said of the Irish and Scotch universities. No doubt when these great national seminaries were first instituted, landowners and those whose sons they were designed to furnish with a suitable education were in a position similar to what the great bulk of farmers are in at the present time, so that as a question of expediency it may be argued that the young lairds and lords should be turned adrift to shift for themselves, and that these great seminaries, English, Irish, and Scotch, should be modernised to suit the wants of the agricultural body and others usually designated middle-classes, less able to pay for their education, but who are taxed equally, if not more heavily, collectively speaking, than the upper classes. Either such ought to be the rule, or else if the upper classes are allowed to retain the great national seminaries in question, then they (the upper classes) ought to be taxed to support modern schools and colleges for the middle classes. It is not likely that either of these two propositions will be practically carried into effect; but so far as the agricultural body is concerned, the existing anomalous state of things should be borne in mind by landowners, who get their sons educated principally at the expense of the public, including their own tenants; for so long as the lower and middle classes are thus heavily taxed to pay for the education of the upper and more wealthy classes, they will, as a matter of course, be less able to pay for the proper education of their own families.

It will thus be seen that the existence of the old system, with its rich endowments and less amount of labour to perform in teaching, including the precept and example which it affords, opposes the progress of the more meritorious and self-supporting plan. That our old universities ought to undergo a thorough reformation in the subdivision of labour and class-rooms so as to conform to the requirements of modern times is manifest, and in such a reformation we do not see why teachers and professors ought not to be placed more and more upon the taskwork principle, and wealthy students made to pay higher fees, so as in a great measure to cover their education, Government grants and revenues from endowed properties being confined to buildings, museums, laboratories, and experimental expenses in the different branches of science, without regard to that social division into upper, middle, and lower classes.

The least objectionable mode of Government assistance is where it is confined to purchasing school and college grounds, erecting buildings, furnishing museums and laboratories and other permanent works of this kind, and then leaving teachers and taught to do the rest on the self-supporting plan. For a few years small sums in the form of salaries may, in some cases, be given in order to start the self-supporting system into healthy effective action; but such salaries should be terminable, and the teachers and professors thrown ultimately wholly upon their own industry; for it is clearly, as has already been shown, the more remunerating plan for teachers themselves, also the cheapest plan for the taught, and the best plan

for all parties interested, provided always that the teachers are thorough masters of the art of teaching.

Charity-schools and colleges, endowed or supported by private individuals, are free from many of the objections to which Government ones are subject.

Many of our national seminaries, such as the Universities of Oxford and Cambridge, are largely included under this system, land and money having been left them by private individuals for educational purposes; and in a similar manner many of our large charitable institutions for the education of certain classes of society are less or more mixed up with Government grants, the latter having been found necessary to give efficiency to the former in terms of the bequests of the donors. There is a large portion of the rising generation without the means of obtaining an elementary education, and private charity can hardly be turned into a better channel than in providing such for this class, whose members, it must be borne in mind, are not exclusively confined to the lower orders of society, but include many of the upper ranks. Hence the different grades of charity schools which have been instituted to meet the exigencies of the case, both on the day-school principle and also boarding-school principle.

In a review of this kind of schools the details are far beyond our limits for discussing in a single paper. This is perhaps of less importance, since comparatively little or no charity has been extended towards the education of the practically agricultural body, *i.e.*, tenant-farmers and labourers. No doubt a few bursaries at some of our Universities are open to competition for the sons of the better-to-do class of farmers, and a few who work their way upwards under public or private teaching to finish their education at college; but, when compared with the great bulk of the agricultural body, including small farmers and labourers, they must rather be considered an exception than otherwise.

It must not be inferred from this that we are advocating the gratuitous education of the rising generation of the agricultural body. Nothing could be farther from our mind, for the small tenant farmers and agricultural labourers ought always to be able to pay for the education of their children. No doubt there are a few orphans for whom charitable provision requires to be made, and for them alone we advocate a gratuitous education. Charity advanced in the form of school fees farther than this, is in too many instances charity misapplied. At the same time landowners, including those of corporate towns, may grant schools and colleges rent free, and uphold them advantageously, as some of them do, without any sacrifice of the self-supporting principle, as they would in the vast majority of cases derive indirectly ample interest on their capitals thus invested, while the industry of teachers and taught would be mutually stimulated; by doing so they would in some measure repay the advantages they themselves gratuitously derive from our national universities and schools at which they are educated.

**THE LATE DUKE OF RICHMOND.**—"A gay, wild-eyed roan with a white calf brought our eye back to short-horns in the pastures at Old Mills, where Mr. Lawson has a nice herd; and in front of us, about a mile away, the 'sun shines fair' on the cupolas and warmly-tinted sandstone of the Elgin houses. Hard by it is the celebrated Green, where many a shorthorn Waterloo has been fought, and where buyer and seller have set each other like cocks so often, with 'The Cock of the North' to look on. There, too, came 'The Farmer's Friend' in his simple guise, like an old soldier, always in time, and with a kind greeting and a pleasant story on his lips. Buchan Hero of the white eyelash had passed away from Mr. Ferguson Simpson's hands before that gentleman took up his residence at Coveea, near Elgin. Hence he never joined the bull ranks on the Green; but he won in a still greater fight at Berwick-on-Tweed, against 'the English bulls, the Scotch bulls, and a' the bulls. One of his great admirers, who had his eye to a 'crank' in the palings on that memorable day, thus describes the contest: 'I lookit, and they drew them, and they sent a vast of them back; again I lookit, and still the Buchan Hero stood at the head. They had nae doot of him then. A Yorkshireman was varra fond of him. And he wan; and Mr. Simpson sent him to Sir Charles Tempest for two hundred. It was a proud day that for Aberdeenshire and Mr. Simpson.' We rode through Elgin without drawing

rein. Time was pressing, and we were only just able to admire the thistle on the fountain, to wonder why there should be both a 'Batchen-street' and a 'Batchen-lane,' and to glance from the gaunt-eyed, thin-legged wayfarer who illustrates the psalm over the Alma House door, to the ruined cathedral, where the ivy was shrouding the savage handiwork of 'the Wolf of Badenoch.' The road wound round some curious heather knolls, and the long beech hedges and the Gordon tartan, green with a single yellow stripe, soon showed that Fochabers was nigh. The late Duke of Richmond used to tell with great glee how, when other officers indulged in gaudy papers, he lined his tent at Aldershot with tartan during his stay there with the Sussex militia, and how he proved himself the canny Scot by untacking it and carrying it back to Goodwood with him, to 'serve in the next campaign.' Shortly before the late Duke's death in 1860, a new outlet was made to the Spey, but it did not just chime in with the temper of this most rapid and unmanageable of Scottish rivers, and taking a turn eastward, it all but cut away the fishing station at Tugnet. Watching the progress of the works to defend the village

of Garmonth and its adjacent port of Kingtown, gave his Grace almost a daily object for a four-mile drive during his last summer at Gordon Castle. When he had seen Tugnet, he would often go and visit a small steading which he was putting up near the railway station. The tenant only paid £8 a-year; but he was an old Peninsular man, and there was the great tie. Many and long were his cracks about old times and comrades with Captain Fife, who has also exchanged his sword for a ploughshare. His Grace quite astonished another old 'cannon-ball' of the district, who did not know him by sight, when he asked him to fetch his Sunday waistcoat with the medal on it. The old man could not tell for his life 'how the gentleman kenned I wur thier, and that I wur hit gan down the brae at Orthes: it's true enough. Did ye ever hear the like?' It was the Duke's earnest care that his tenants should do well, and he latterly loved far more to be among his farm improvements and his Southdowns than he did to go to Glenfiddich, where he had once been wont to spend nearly half of his three months' stay."—"Field and Fern, or Scottish Flocks and Herds," by "The Druid."

### PROFESSOR SIMONDS ON THE CATTLE PLAGUE.

At a meeting of Norfolk farmers Mr. C. S. Read, M.P., presided; and Mr. E. Howes, M.P., and Professor Simonds were among those present.

The CHAIRMAN stated the result of an interview which he and some other gentlemen had had at the Home-office on Monday with Mr. Waddington. Before they went to the Home-office they proceeded to the Metropolitan Cattle-market, where they found that the inspectors had made a rigorous examination, and had excluded some cattle. They saw some, however, in which they fancied they could discover symptoms of the disease. Professor Simonds accompanied them to the Home-office, where they suggested that the Order in Council which had been issued for the metropolis should be extended to Norfolk. The difficulty stated to exist was that an Order in Council could only be applied to a town or place within certain defined limits. It was suggested that it would be desirable if possible to prevent the removal of diseased cattle to different parts of the country, but there was a disinclination on the part of the Government to make such an order. A suggestion was then made for the more efficient supervision of cattle landed in England and for putting store stock in quarantine. It was objected that there could be no quarantine, as there was no accommodation for the stock; and it was also stated that the existing inspection was considered to be sufficient. Professor Simonds suggested that there should be a better inspection of cattle coming from Russia. This opinion was favourably received. The Chairman, in conclusion, hinted that farmers should agree not to purchase stock in markets or fairs for at least six weeks. This would prevent an importation of foreign cattle and check the spread of the contagion.

Various statements were made as to the state of cattle in Norfolk. From some localities the reports were very discouraging, but in other districts the cattle appeared to be still healthy.

Professor SIMONDS expressed his opinion that farmers might rely upon receiving some assistance from the Government, but that in the main they must rely on themselves. The reason why so little could be expected from the Government was the lamentable condition of our legislation upon these matters. He was perfectly satisfied that the disease would spread in the several places where it now existed, and that sooner or later, unless stringent measures be taken, the whole of the country would be affected. He did not come to this conclusion simply because he viewed the disease as one which spreads its contagion, or, if he took the view of his friend Mr. Wells, because it was atmospheric, but he came to the conclusion from positive experience which had been gained in other countries, and also from the records which were left to us of the experience which was gained in this country 120 years ago, when the disease existed in England. It was recorded that in 1745 the disease made its appearance in England, and that it existed from time to time down to 1757.

When they came to look at the small amount of traffic which then existed among cattle, when they came to look at the state of society as a whole, at that time, and when they considered that, under the circumstances which then prevailed, the plague lasted 12 years, they had certainly not much encouragement or hope for its removal under existing circumstances. It was also not very encouraging for them to remember the fact that at the time of the last disease an Act of Parliament was passed, empowering the King in Council to issue orders for information to be immediately given to the local authorities by farmers and others whose cattle were affected, and upon that information the King was empowered to order all such animals to be killed and buried in pits with their hides on, the additional precaution of throwing quicklime in the pits, and keeping the ground enclosed for a given time, being also taken. All these measures failed to exterminate the disease which existed at the time of which he was speaking; and, as to the identity of the disease with the one which now existed there could not be a question, because those who described it at that time were well calculated to do so, they being chiefly physicians. It was very true that veterinary science was then in its infancy—in fact it was scarcely in existence; but the medical science was of course very different.

The CHAIRMAN asked whether the last outbreak was occasioned by foreign importation?

Professor SIMONDS said it would be difficult to answer a question of that sort, but he had no doubt that the disease was introduced on that occasion as it had been on the present occasion. A statement was on record that two calves were purchased from some persons residing in Holland, the farmer who made the purchase having the idea that the Holland calves would improve his own stock, and when they came to look at the milking qualities of the Dutch cattle they might understand that there was a certain amount of truth in that statement. Another statement was a very important one, and was very likely to be true—namely, that some persons had purchased from Zealand a large number of hides which had been taken from diseased cattle, and they were stealthily brought over to this country for the sake of making more money of them. Either of those statements might be correct, and he (Professor Simonds) was inclined to believe them, but about the introduction of the disease at that time there could not be a question. They must recollect that this was a disease not belonging to England. It no more belonged to us than the Asiatic cholera, the yellow fever, or any other of those diseases belonged to us. It was a disease specially belonging to Russia, Austria, and the Danubian provinces, Bessarabia, and the whole of the countries lying eastward. The countries on the west side of the line were strangers to the disease, save and except upon its introduction. Sometimes it went into Prussia, sometimes into Bohemia, and sometimes into Bavaria; but it never went there except upon the introduction of cattle in



whose systems the disease was either incubated at the time, or the cattle themselves were positively in a state of disease. It was, however, scarcely possible for the disease to be introduced in the latter way, because the sanitary regulations of those countries were such as to prevent animals in that state being allowed to pass. Therefore it could only be brought by animals after the ordinary period of incubation had passed, and before the disease had begun to declare itself. It would always be a knotty point for them to decide; in fact, he dared say they never would be able to decide it to the satisfaction of all their minds. There were such men to be met with in the medical profession, and also in their own profession, who were called contagionists; and there were men not at all favourable to this view, of disease being spread by contagion, or at any rate, not being exclusively spread by contagion; it was difficult, of course, to draw a line between the two opinions. Perhaps it might be that the truth lay in the middle there as it did in other things; but let them at the same time not lose sight of the fact that the disease was contagious, and that it was by infection that it extended itself. It was true that they could not always trace every individual case as it occurred, as they had heard that morning, but it was very difficult indeed to do that when they knew the various sources by which the disease spread and the various *media* that might be brought into operation. For instance, if they placed some sheep with unhealthy cattle, those sheep which were not themselves subject to the same disease would not become affected for a month or two, or more; but, of course, the danger was to other cattle. If they took sheep from an infected to a non-infected lot of cattle—he did not care whether it was a mile or two miles off—and mixed them with a lot which were perfectly healthy, the latter would be as likely to take the disease as though they had been placed with the diseased cattle themselves. He knew of an outbreak which occurred the other day in the neighbourhood of London, where the animals were apparently isolated from all others. It was said, "Oh, here is a case of spontaneous origin." He had inquired into the case, and the fact was found to be that the sheep were placed in pasture in a park, a portion of the park being let off to dealers, and the dealers were in the habit of not only taking their sheep to the park from the market, but occasionally they would allow them to remain, if not sold, until another market. This being so, he thought they could not wonder at the existence of the disease in the market. Could anybody say that we had had in this country a real good case of spontaneous origin of the disease? He had shown that for more than 100 years this country had been free from the disease, and surely during that time there had been sufficient mismanagement among animals to induce the disease to appear if it could be induced. Not only had this country been free from the disease, but it might be said that the whole of the continent of Europe, generally speaking, had also been free from it for many years. It was a fact, however, that it had now been introduced. How did it get into Norfolk? Directly from the Metropolitan Market. How did it get into Suffolk? Directly from the Metropolitan Market. How did it get into Shropshire? Directly from the Metropolitan Market. He could show them that in almost every case—certainly every case which he had traced out—it was through the Metropolitan Market and through the great traffic of cattle in this country that the disease had spread as it had done. He would give them an instance as to how it had spread in Sussex. Two or three farmers, residing not far from Chichester, were dairy farmers. They were in the habit, as was the custom in some parts of Sussex, of making veal by calves. One farmer went to Chichester market and bought a calf. Believing that it was a country calf, and had been sent there by a brother-farmer, he put it to a cow, and in two or three days afterwards it was noticed to be dead. He was stating a fact which occurred in Sussex. A cow next the calf-pen was first attacked, and then the cow which suckled the calf was next attacked; so that the more directly cattle were together the more certainty there was of the spread of the disease. In the cases mentioned 11 cows and 12 calves died. Another farmer lost 15 cows and 15 calves by introducing into his dairy a calf purchased from the same source. He thought this was an answer to the argument that the disease was an atmospherical affection. It seemed to him that the best way in which this evil could be met was to form in the different counties, where the

disease existed, societies such as that which it was proposed to organize in Norfolk. By such associations they could, for example, in Norwich put in full force an inspectorship of the market, and so on. This would do good, no doubt, but not so much as we might at first sight expect, because there might be a large number of cattle on Norwich-hill which had been exposed to the infection without any one knowing of it, as there might be no signs by which the disease could be recognized at the time; but there would be a moral effect—persons knowing there would be an inspector, and not knowing how soon an animal would show the disease, would hesitate to send such animals to the market, and a great amount of good might thus be done. With regard to seizing diseased animals, that was an important point, and the law could be put in force in all towns where there were corporations or powers sufficient. A great deal might be done by the towns, and a great deal might be done by union on the part of cattle owners, farmers, and others. If they carried out the principle laid down by Sir Thomas Beauchamp, of non-remuneration to an individual who should not within a certain length of time give notice of the existence of the disease, they would be doing an immense amount of good, and he had heard that proposition with great pleasure. There were one or two other points he should like to say a word upon, because they had not altogether escaped those whose duty it had been to take some prominent part in this matter. One was the proposition that they should abstain from buying cattle for a certain length of time, and it was also suggested that they should abstain from buying foreign cattle. He considered that those two recommendations would have contributed greatly to the value of certain propositions of his which had been put in type by the Privy Council, and circulated, he believed, by the newspapers throughout the length and breadth of the land. He hardly knew whether, at a meeting like that, it was legitimate in him to say that those two propositions were really the first two that stood on his list (Hear, hear), but as he was only a servant of the Government it was not for him to disagree with their putting a pen through those propositions, which had been done, not because the Government were desirous of doing what would in any way prevent benefit arising from resolutions of the kind, but that they felt that they might be hereafter called upon to frame some resolution on that basis which they could not practically carry out. For that reason, therefore, those propositions were struck out. His proposal was, not only that no farmers' purchases should be made for six weeks, but that none should be made at all except to the extent of buying animals fit for slaughtering, that no store stock should be bought at a fair or market at all, but that the farmers should buy of each other, and not at the fairs or markets, for a time. With regard to foreign cattle, he had suggested that they should avoid buying them, as it was by them that the disease had been brought into this country. When he said they should avoid buying foreign cattle, he did not mean that they should avoid buying cattle which was food for the people, but that they should avoid buying foreign cattle that were not fit for food for the people, and which when bought they must bring on to their own farms to graze. Let the farmers get their profits—if they got any profits at all—out of their own stock, and not encourage foreigners to send their stock over here (Hear, hear). Mr. Read had very properly drawn attention to the impropriety of sending foreign store stock throughout this country, and he had suggested the other day that store stock should not be permitted to come into our ports. But who was to draw the line of demarcation between a store animal and a lean animal that was fit to be slaughtered? If any of those he was addressing went, as he had done, into the Metropolitan Market, and saw the beast sold to be knocked down by the butchers, they would be puzzled to know what was a store animal and what was a fat animal (laughter). There was such an immense amount of practical difficulty in the way that it really could not be carried out; but they might do something with reference to importations from abroad. So long as they kept westward of the line he had alluded to, there was no risk of bringing the disease into the country; the moment they crossed the boundary, that moment danger arose. It was a question to consider when the danger arose, and he believed it was only within the last two or three months that this kind of commerce had extended its ramifications into Russia, Hungary, Poland, and Galicia, and what had been

the effect of it? He had heard of a lot of Russian cattle coming here. It was told to him in the most incidental manner, and he began to study when he heard of it, because he knew that Russia was the home of the disease, and consequently he knew the risk the English people were running. He inquired how they were coming. He was told they were to be got together at Revel. He asked were they coming over the Baltic, and was told they were, and that probably they would come to Hull. He kept his eye on that cargo, so to speak, and determined to find out all about it. He had no reason to believe that any of those animals were affected by the disease, but he alluded to it to show how the traffic had come. The animals were got together at Revel, and sent over in an experimental boat. They were bought in Russia at a very low price, which left a large margin in England to cover expenses; they were put on board a vessel, they came round by Denmark, stopped at Copenhagen to take orders as to whether they should be taken to Hull, or London, or elsewhere, as suited the policy of the importers, because when they talked about Dutch cattle they probably came directly from Holland, but were not necessarily Dutch, and this was what caused the difficulty with regard to quarantine. In one boat he had alluded to, there were 320, and 145 were sold in Hull, parts of which went to Manchester, Derby, Wakefield, and that district. The remainder, 175, went to London, lay for two or three days in the lay-house close by Islington, where the disease first broke out, and when sold in the Metropolitan Market no less than 120 of them went down to Gosport to supply the shipping. A similar thing had occurred at Plymouth, and only yesterday the town-clerk of Plymouth was with the authorities at the Privy Council-office, and he spoke of the disease existing there—carried there in the same manner by cattle bought in the Metropolitan Market, and sent down for the supply of shipping. Hence it was that the disease got spread. They found that there was a little too much difficulty in the way of coming round by that tempestuous sea the Baltic, and so they adopted the plan of sending the cattle from Revel and other ports to Lubeck, where they were put on the rail and sent to Hamburg and shipped with animals collected together at Hamburg, the whole of them coming over together; so that when they arrived here no one could tell where the cargo came from. Part of them might be perfectly healthy and from a healthy district, while part might come from an infected district. If they could shut the door against importations from those countries he had alluded to, they would be doing much good. Under the Importation Act they were empowered to take any measures they liked; they could even slaughter all diseased animals when they came in, could burn all the material they were surrounded by, disinfect the ship—in fact, the powers were unlimited. Consequently there was plenty of power to regulate the importations; but here was the difficulty—how could they, seeing that the cattle were brought overland to Antwerp by way of Mayence, and shipped there—how could they identify every animal? He believed, however, they might do a vast amount of good by shutting those Baltic ports, and that if they could obtain an Order in Council to prevent animals from being brought from ports of Russia, and if they planted a man familiar with the breeds of cattle and the ins and outs of the cattle trade at Lubeck, if the Lubeck Government would give power to put such a man there, as Mr. Waddington seemed to think they would, they would be shutting out one of the chief sources of the supply to this country of infected animals. If they did not adopt all these precautions they would have importation on importation year after year, from which the result would be a continued loss to this country. It was a most difficult question for the Government to deal with, when they remembered what was the present price of meat, and that the English were a meat-eating people. Their present purpose was chiefly to get rid of the evil now existing. He had before said that every one must look out for himself and his own interest, and to a great extent be his own policeman in this matter as well as a policeman over his neighbour, and he felt assured they would to a considerable extent exterminate the disease from their own districts (Hear, hear).

The CHAIRMAN asked if it were a fact that the development of the Russian cattle trade had only just taken place.

Professor SIMONDS believed that until the last few months absolutely no animals were brought from Russia to this coun-

try, which arose from the fact that they could not bring them by way of Prussia. When he saw some Russian oxen, he asked some of the proprietors how they got them there. They said they did not know. He asked how they crossed the Prussian frontier, and was told they came by way of Prague. His reply was, that they must have come by way of Cracow, as the rails went there, and he could not understand how they were got here. His own opinion was that they had not come that way at all, but had come by way of the Baltic to Lubeck, and thence overland. It would not answer the dealer's purpose to send them the other way. The delays were too great for them to be brought overland; and this was one of the hopes he had from shutting the Russian ports. The Hungarian oxen they had not much fear of. It is true they might have had something to do with bringing the disease here; but the gathering together of Hungarian oxen at Vienna, the length of time occupied in getting them to Mayence, and from Mayence to Antwerp, and then shipping them here, exceeded the period of the disease; so that if they arrived in a diseased condition it would be perceived by our inspectors, and no harm would be done by them. Besides this, in Hungary a cordon was drawn round a farm immediately the disease appeared; no man, woman, or child was allowed to go off or on, not merely during the existence of the disease, but for three weeks after killing the last animal. Even congregations in the churches were interfered with; roads were turned when possible, to prevent passengers passing too near the infected localities, and the most extraordinary measures, to English ears, were taken to prevent the spread of the contagion. It could only be by passing through a thousand such cordons that the disease could get to this country. Knowing that all these regulations existed there, and that so sharp a look-out was kept, he was inclined to believe that if the Russian ports were shut the disease would be shut out (Hear).

Mr. WELLS asked Professor SIMONDS whether he really thought the disease was spread by contagion or infection, and in no other way.

Professor SIMONDS said this was not a meeting for discussing the pathology of the disease, and therefore they could not go fully into that part of the question, although it had the highest interest for members of the profession; but he thought that when they looked at all the facts in connection with the disease, they were justified in saying that it only spread by contagion or infection. It was true that it could be hemmed in, and was hemmed in. It might exist in a village where one farm was infected, and there were perhaps twenty cattle on that farm, and although there might be a hundred and fifty or two hundred other cattle in the village, if the regulations were well carried out they kept it entirely within the boundary.

After further conversation, the proceedings terminated.

## THE DISEASE IN CATTLE.

SIR.—Having been for above 30 years extensively connected with the trade and sale of cattle, I feel it my duty to forward you the following facts and my experience relative to the present disease in cattle, which I think you will deem ought to be published.

While we naturally view with alarm the disease among cattle, and are anxious that every precaution and proper steps should be taken to stay the spread of such a calamity, yet the public should hesitate before they give credence to the reiterated statements made by certain professors connected with veterinary companies and colleges. We find upon examination of their statements that they do not understand the origin and cause of the disease, neither have they any remedies that have been proved to be of any use or in the least efficacious; also, they are entirely at variance in their opinions among themselves. It is assumed by some that this disease has been imported from abroad, yet though the most strict inspection, under the direction of Government, has been made of every head of foreign cattle, it is not proved that any are unsound, but on the contrary, that they are more sound than English, Irish, or Scotch. This being well known by those who buy and slaughter them, they are especially and almost invariably bought for those parties who are the most particular in their investigation, viz., the Jews. No class of people pay so much attention to the cleanliness, wholesomeness, and sound state of their meat; priests are appointed to see their oxen killed, and most mi-

entirely examine the carcasses: this must be admitted as a very distinct test of the soundness of foreign oxen. It is also a fact that 80 per cent. of all the oxen bought to supply the Government contracts are foreign: about 600 per week throughout the year are required for these contracts. All the beasts are subject to a second rigorous official inspection before they are allowed to be killed at the various dock-yards, and then there is a due inspection of the meat.

It is a very serious matter for any person to assert that for which there is not the least proof, viz., that the disease is brought into this country by the importation of foreign cattle. It is a great blessing that they do come to help to supply the increasing demand of food for the people. What would otherwise be the fearful price of meat? Last Monday we had 3,800 foreign cattle in the Metropolitan Market all perfectly sound, some of which, from their excellent quality, made as high price per lb. as English, some moderately-sized beasts from Bremen making £30 each.

One of Professor Gamgee's sapient remarks—that the increased supply by foreign beasts, which is above one-third of the whole supply of the London markets, tends to increase the price of meat—proves that such Professors are merely professors; but those who heard his contradictory statements of his own statistics in the committee of the House of Commons last year, will know what reliance to place on his observations.

As to the proposition of causing foreign cattle to undergo a quarantine for a fortnight, this would be perfectly unreasonable; for where could be the sense or justice of detaining 5,000 cattle per week, if needed for immediate consumption, and which are pronounced by efficient Government inspectors to be sound, in the vicinity of London, where they might imbibe the very disease which is prevalent in this country?

As chairman of a large meeting, held last year, of graziers, salesmen, and others interested in the trade and feeding of cattle, relative to the foot-and-mouth complaint, it became my duty to sign a circular, at the direction of the meeting, addressed to each Member of Parliament, to the effect that, in the opinion of the meeting, the foot-and-mouth disease was caused by a baneful atmospheric influence; Professor Simonds subscribed to and concurred in this opinion, and in each expression of the letter. If the foot-and-mouth complaint was then caused by the bad state of the atmosphere, why not the present disease, which simultaneously attacks animals in various counties where they have not had any contact with foreign cattle? what is to stay the winds of the atmosphere from visiting not only counties, but countries?

In the absence of all proof that this disease is imported, for no foreign stock has been known to be affected until they have been a considerable time in this country, is it not reasonable to conclude that it is a species of cholera in the air? There is nothing antagonistic to this theory in the fact that the cowsheds of London are very generally attacked. In the case of fevers and epidemics, would they not dwell and be fixed in localities that were badly drained, and not properly ventilated? About 180 years since England was visited by a similar scourge; no foreign cattle was then sent.

The importance of the subject I trust will be a sufficient excuse for troubling you with this letter, feeling it my duty to give publicity to facts that come under my extended experience.

I remain, yours obediently,

Stoke Newington, Aug. 11.

JOHN GIBLETT.

#### PROFESSOR FERGUSON'S REPORT TO THE IRISH GOVERNMENT.

In accordance with instructions received from the Irish Executive, I proceeded to London to investigate the nature of the cattle plague now raging in that metropolis, and the best means of preventing its introduction into Ireland. On seeing some of the cases, which were shown to me by Professor Spooner, the principal of the Royal Veterinary College at Camden Town, I immediately recognised the disease as an old European continental acquaintance—one which had frequently ravaged the bovine herds of Europe, particularly those of the northern and midland states. The cattle malady, at present so fatal among the dairies of London, and also to the cattle of many of the English provinces, to which it has already extended, is malignant, contagious typhus—the most important peculiarities of which are its great fatality and rapid

extension by contagion and infection. It is much more contagious, infectious, and fatal, than any other disease affecting the oxen tribe. It is also considerably less amenable to medical treatment, all kinds of which it has hitherto set most completely at defiance. Although by the majority of veterinarians and agriculturists malignant bovine typhus is considered to be invariably the result of contagion or infection, or both, such is not the case. Malignant typhus can be generated in an animal without being the result of either infection or contagion; but once generated here in a single animal it becomes rapidly extended and multiplied by contagion and infection. Some veterinarians deny its being either contagious or infectious. They must, however, be affected either with an obliquity of judgment or an insufficiency of observation and experience relative to the malady in question. It is not alone contagious by immediate contact, but can be propagated from diseased to healthy animals by mediate infection, or the latter coming in close proximity with objects that have been in contact with or the close neighbourhood of the latter. Dogs, cats, and even fowl are capable of becoming the vehicles of malignant typhus infection. This ceases to be a matter of wonder when it becomes known that the mouth-and-foot distemper can be carried from an infected townland or a farm to one at a considerable distance, on which the herds and flocks have hitherto been sound, by crows and other wild birds. These feathered carriers of pustular infection, by walking over the infected pastures, get some of the infectious matter on their feet, and in their flights in search of food convey it to distant fields and pastures. However far-fetched may seem this theory, it has been proved or demonstrated to be true by a pinioned tame jackdaw being used in an experiment to test it by being made to walk in a pen of infected sheep. His feet would take up and retain a sufficient quantity of pustular infection to infect a hitherto healthy portion of another and distant pasture. The experiment was a successful one. In a few days the sheep confined in a pen on the hitherto healthy pasture, into which the jackdaw had been turned after being among infected sheep, were all affected with the foot-and-mouth distemper. The important question to be now decided by the Government is, what are the best means of preventing the introduction of the cattle plague or malignant contagious typhus into Ireland? There is but one way in which the disease can be prevented from affecting the bovine herds of this island, and that is the immediate prohibition, by an order in council, of the importation of any cattle from the seaboard into Ireland. I wish it to be distinctly understood by the Irish Executive that I regard the total prohibition of cattle importation into Ireland, as long as there is the slightest trace of the disease in England, or those states having the disease in them, from which that country imports cattle, as the only means that have any probability of preventing the introduction of the cattle plague into Ireland. I am thereby adverse to any less stringent measures, such as quarantine. And even should importation be totally prohibited, it is by no means certain that the disease may not become generated from mere atmospheric influence, or propagated by mediate infection, over the vehicles of which Government have no control whatever.

HUGH FERGUSON,

Her Majesty's Veterinary Surgeon in Ireland.

#### THE CATTLE DISEASE.

A supplement to the *London Gazette* of Friday, published on Saturday, August 12, contains two orders by the Lords of the Privy Council, dated the 11th of August, relative to the cattle disease. The first is in the following terms:—

"Whereas, by an Act passed in the Session of the 11th and 12th years of her present Majesty's reign, intituled 'An Act to prevent until the 1st day of September, 1850, and to the end of the then next Session of Parliament the spreading of contagious or infectious disorders among sheep, cattle, and other animals,' and which has since been from time to time continued by divers subsequent Acts, it is (among other things) enacted that it shall be lawful for the Lords and others of her Majesty's Privy Council, or any two or more of them, from time to time to make such orders and regulations as to them may seem necessary for the purpose of prohibiting or regulating the removal to or from such parts or places as they may designate

in such order or orders, of sheep, cattle, horses, swine, or other animals, or of meat, skins, hides, horns, hoofs, or other part of any animals, or of hay, straw, fodder, or other articles likely to propagate infection; and also for the purpose of purifying any yard, stable, outhouse, or other place, or any waggons, carts, carriages, or other vehicles; and also for the purpose of directing how any animals dying in a diseased state, or any animals, parts of animals, or other things seized under the provisions of this Act are to be disposed of; and also for the purpose of causing notices to be given of the appearance of any disorder among sheep, cattle, or other animals, and to make any other orders or regulations for the purpose of giving effect to the provisions of the said Act, and again to revoke, alter, or vary any such orders or regulations; and that all provisions for any of the purposes aforesaid in any such order or orders contained shall have the like force and effect as if the same had been inserted in the said Act; and that all persons offending against the said Act shall for each and every offence forfeit and pay any sum not exceeding £20, or such smaller sum as the said Lords or others of Her Majesty's Privy Council may in any case by such order direct:

"And whereas an order was made in pursuance of the authority of the said Acts on the 24th of July, 1865, by the Lords of Her Majesty's Most Hon. Privy Council, applicable to the city of London and to the metropolitan police district, containing certain provisions for the purpose of preventing the spreading of a certain disorder, of which the nature was at the time of the making of the said order uncertain, but which has since been ascertained to be of a typhoid nature, and is commonly designated as the 'cattle plague,' and which may be recognized by the following symptoms:—

"Great depression of the vital powers, frequent shivering, staggering gait, cold extremities, quick and short breathing, drooping head, reddened eyes, with a discharge from them, and also from the nostrils, of a mucous nature, raw-looking places on the inner side of the lips and roof of the mouth, diarrhoea, or dysenteric purging."

"And whereas inspectors have been appointed in pursuance of the provisions of such order:

"And whereas it is expedient to make further regulations or the district to which the said order is applicable:

"Now, therefore, the Lords of Her Majesty's Privy Council do hereby, by virtue and in exercise of the powers given by the said recited Act, and the several Acts continuing the same, as aforesaid, order as follows:—

"1. That in this order the word 'animal' shall be interpreted to mean any cow, heifer, bull, *bull-dog*, ox, or calf.

"2. Every inspector appointed or to be appointed under the provisions of the Order in Council of the 24th of July, 1865, shall have the power of entering upon and inspecting any premises in or upon which he has reason to believe that there is any animal labouring under any such disease, from time to time, as often as he may think necessary.

"3. Every person within any district for which an inspector shall have been appointed as aforesaid, upon whose premises there shall be any animal labouring under any such disorder, shall, as far as practicable, keep such animal separate and apart from all other animals, and no person shall, without the licence of such inspector, send to market, or remove from his premises, any such animal, or any animal which has been in the same shed or stable, or has been herded or been in contact with any animal labouring under such disorder.

"4. Every animal within any such district as aforesaid dying of such disorder, or slaughtered on account thereof, shall be buried, if practicable, on the premises where it has died or been slaughtered, or (if this be not practicable) as near thereto as may be convenient; and if such animal be not buried with its skin, its skin shall be disinfected in such manner as the inspector of the district may direct.

"5. Every person within any such district, on whose premises there shall be any animal so labouring as aforesaid, shall cleanse and disinfect such premises in such manner as the inspector of such district shall direct.

"6. Every person offending against this order shall for every such offence forfeit any sum not exceeding £20, which the justices before whom he or she shall be convicted of such offence may think fit to impose."

The second order repeats the preamble of the first order. It then goes on to say—

"And whereas since the making of the said order the said

disorder has appeared in other parts of England, and it is expedient to extend the provisions of the said order to the remaining parts of England and Wales, and to make further regulations for the purpose aforesaid for the last-mentioned parts of the United Kingdom:

"Now, therefore, the Lords of Her Majesty's Privy Council do hereby, by virtue and in exercise of the powers given by the said recited Act, and by the several Acts continuing the same, as aforesaid, order as follows:

"1. That this order shall extend to all the parts of England and Wales not comprised in the said recited order.

"2. That in this order the word 'animal' shall be interpreted to mean any cow, heifer, bull, bullock, ox, or calf.

"3. If at the date of the publication of this order in the *London Gazette* there shall be any animal labouring under any such disorder in the possession or custody of any cowkeeper, dairyman or dairywoman, or of any milkman or milkwoman, or vendor or purveyor of milk, or of any dealer in cattle, or farmer, or person in possession of cattle, whatsoever, within those parts of the United Kingdom to which this order refers, or if at any time hereafter, while this present order shall continue in force and unrevoked, any animal, being in the possession or custody of any such person as aforesaid within the last-mentioned parts of the United Kingdom, shall be seized or attacked with, or be found labouring or suffering under, any such disorder, notice of the existence of such disorder, or of the first appearance of such disorder in or among the animals belonging to, or in the custody of, any such persons as aforesaid, shall immediately thereupon be given by the person in whose possession or custody such diseased animals or animal shall be, if such person shall reside within any corporate town, to the mayor or other principal officer of the corporation, or, if elsewhere, to the clerk of the justices acting in and for the petty sessional division of the county, or district in the nature of a county, in which he resides; and upon receipt of such notice, or upon any other information which satisfies him or them that such disease has appeared within his or their jurisdiction respectively, it shall be lawful for such mayor, or other principal officer, and for the said justices, if he or they shall think fit, from time to time to appoint some veterinary surgeon, or other person duly qualified, to be an inspector, for the purpose of carrying into effect the following rules and regulations within the corporate town or petty sessional division for which he shall have been appointed, and the same authority may, from time to time, revoke such appointment.

"4. Every such inspector shall have the power of entering upon and inspecting any premises in or upon which he has reason to believe that there is any animal labouring under such disease, from time to time, as often as he may think necessary."

The 5th, 6th, 7th, and 8th rules in the second order are the same as the 3rd, 4th, 5th, and 6th rules of the first order.

## THE BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY.

A monthly meeting of the council of the society was held at Douch's Railway Hotel, Taunton, on the 11th Aug., under the presidency of the Right Hon. the Earl of Portmouth. There were also present Sir J. T. B. Duckworth, bart., Colonels T. D. Acland, M.P., and H. A. F. Luttrell; Drs. Brent and Gillett; Messrs. D. Adair, G. H. Andrews, R. G. Badcock, W. A. Bruce, C. and R. H. Bush, T. Danger, J. T. Davy, J. Daw, F. H. Dickinson, E. S. Drewe, R. Dymond, M. Farratt, H. Fookes, J. Fry, John and Jonathan Gray, J. Gould, B. N. Grenville, M.P., J. D. Hancock, T. Hussey, H. P. Jones, R. K. M. King, J. E. Knollys, J. Lush, H. G. Moysey, S. Pitman, G. S. Poole, W. Porter, W. A. Sanford, J. W. Sillitant, and W. Thomson; H. St. John Maule (Secretary), and J. Goodwin (Editor).

### THE CATTLE PLAGUE.

Before the regular business of the day commenced, Colonel ACLAND, M.P., drew attention to the importance of taking some steps in reference to the visitation commonly known as the cattle plague, which is causing so much alarm in various parts of England. Through the exertions and instrumentality of Mr. Daw, by whom the arrangements had been projected and matured, a meeting had been held at Exeter on the previous

day, when a District Cattle Assurance Association had been formed, and a committee, comprising several members of the council of this society, had been appointed with Mr. R. B. M. Daw as their honorary secretary: at the instance of that meeting, he (Colonel Acland) had undertaken to bring the subject under the notice of their council at their present meeting. Mr. Sanford, also, one of their vice-presidents, had specially come among them for the purpose of calling their attention to the subject.

Mr. Daw (Exeter) said the proper way to cope with the evil would be by prompt action in local areas, and he thought it highly desirable that a Mutual Protection Society should be established, in every Poor Law Union in the counties comprised within the Society's area of operations, for the very simple reason that the area of a Poor Law Union was quite large enough for the distribution of insurance risk, and quite as large as consistent with promptitude of action. At the Exeter meeting on the preceding day they utterly repudiated the idea of treating the matter in the form of a county movement, and at one of the largest meetings ever got together in the Guildhall, they had resolved to establish a Mutual Insurance Association, confined to a district coincident with the area of St. Thomas' Union, believing that that would be the best means of dealing with the evil, and leaving the residents in the other unions to follow their example. Hence it was that they had refused to allow several large stock owners in different parts of the county to become insurers in the Exeter District Association, but rather recommended them at once to form associations in their own immediate neighbourhood. This course of action was the more essential because of the peculiar nature of the disease. The Association would be managed by a committee, of which every insurer of 20 bullocks would be eligible as a member, but it would also include persons of influence and intelligence, who, though not actually owners of stock themselves, might choose to show their interest in the objects of the Association by subscribing as though they were. In the event of any animal being affected, the first step would be to call in an inspector, who would have power to order its immediate destruction; and two practical men having assessed the value of any animal so destroyed, its owner would receive two-thirds or three-fourths of the amount as might be agreed on in the conditions of the Association. It must be obvious that in small areas the affair would be much more manageable than in more extensive districts.

Ultimately a committee was appointed to collect and disseminate information on the subject of the disease, and with authority to communicate with the Chairmen and Clerks of the Boards of Guardians in the several Unions in the six western counties, with the hope of calling the attention of agriculturists throughout the district to the importance of adopting due precautions against the spread of the malady.

A motion to memorialize the Government to adopt additional precautions at the outports, in accordance with the suggestions of Mr. Andrews at an earlier stage of the meeting, was negatived by the casting vote of the Chairman.

A meeting of the Committee appointed to collect and disseminate information on the subject of the Cattle Plague was held at Douch's Hotel, Taunton, on Saturday, Aug. 12th, immediately after the rising of the Council. The members present were Mr. E. A. Sanford, in the chair, Col. Acland, M.P., and Mr. Daw.

The following form of letter to the Chairmen and Clerks of Boards of Guardians in the Poor Law Unions in the counties of Somerset, Devon, Cornwall, Dorset, Wilts, and Gloucester was settled and approved, and ordered to be signed by the Hon. Secretary and Secretary:

#### "THE CATTLE PLAGUE.

"Bath, August 14th, 1865.

"Sir,—We are directed by the Council of the Bath and West of England Society to communicate to you their opinion that an association for the mutual protection of agriculturists should be established within the area of each Poor Law Union, in consequence of the cattle plague having appeared in the west of England. We have the honour to request that you will be so kind as to take, with the utmost promptitude, such measures as you may deem most suitable to submit the consideration of this question to a meeting representing the different parishes of your union.

"We beg to inform you that such an association has been established for Exeter and the St. Thomas' union surrounding that city. The rules adopted by that association shall be forwarded to you without delay.

The Council have appointed a committee to collect and disseminate information on this important subject; and we are directed by that committee to furnish you with a copy of a circular which has been suggested to the Council as likely to be productive of good effects in arresting the progress of the disease.

"We have the honour to be, Sir,

"Your obedient servants,

"H. ST. JOHN MAULE, Hon. Secretary.

"JOSIAH GOODWIN, Secretary."

The following letter has been received from the Clerk of the Privy Council, by the Secretary of the Bath and West of England Society:

Privy Council Office, Whitehall, 17th August, 1865.

SIR,—I am directed by the Lords of the Council to acknowledge the receipt of your letter of the 14th inst., communicating the opinion of the Bath and West of England Society for the Encouragement of Agriculture, Arts, and Commerce, that an association for the mutual protection of agriculturists should be established within the area of each poor law union, in consequence of the cattle plague having appeared in the West of England, and enclosing a copy of a circular issued by the society; and I am to state that their lordships highly approve of the efforts made by the society with a view to prevent the spreading of the disease, and they trust that the judicious suggestions made by the society will be extensively adopted.

I am, sir, your obedient servant,

ARTHUR HELPS.

The Secretary of the Bath and West of England Society for the encouragement of Agriculture, Arts, Manufactures, and Commerce.

#### THE NEW OFFICERS.

At the meeting of the Council held at Taunton on Saturday last, Mr. H. St. John Maule, who at a former meeting of the Council had resigned the office of secretary, was elected honorary secretary; while Mr. J. Goodwin, who will still continue to edit the society's Journal, was elected secretary in succession to Mr. Maule: and Mr. Spackman, land agent and surveyor, Terrace-walk, Bath, was elected to the office of official superintendent or director of the show-yard. The business of the Society will henceforth be conducted in offices devoted to that purpose exclusively, a course rendered absolutely necessary by the annually increasing magnitude of the Society's operations.

AN EFFICACIOUS REMEDY FOR THE CATTLE DISEASE is tar-water, made of the best Barbadoes tar, and capsicum. Boil one ounce of capsicum in four gallons of water. When the decoction has cooled down to 100 degrees of heat, pour the same on one gallon of tar, stirring it well ten or fifteen minutes with a flat stick. Let it stand twenty-four hours or more. Then pour off the liquor, and administer to each beast from one to one-and-a-half pints, three times a day, until the whole four gallons are taken, which seldom fails in performing a cure. Smear a little tar on each nostril, and upon every foot, and between each hoof. The cattle-houses should be well cleaned and limewashed, and the mangers and cribs painted over with hot tar, that which has been used for making the tar-water being sufficient for that purpose. The same, being burned in the cattle-houses, corrects the air in them; but this should be done when they are empty, ere any hay or straw is placed in them, to avoid the risk of fire. Bran-mashes, with a little oatmeal gruel, sweet hay, or sliced turnips may be used as diet, with pure water, and a small quantity of common salt therein. Keep the bowels moderately open with an occasional dose of castor oil and a table-spoonful of sweet spirits of nitre. This is a cheap, safe, and efficacious remedy. Good ventilation, combined with proper drainage for conveying the excrement away through pipes or brick tunnels, is absolutely necessary, to prevent the effluvia arising from contaminating the surrounding atmosphere and spreading distemper amongst the inhabitants, as this is a contagious disease, that ought to be immediately arrested, or direful consequences will be the result.—Weedon House Aug. 26.

## PRUSSIAN OFFICIAL REPORT ON THE CATTLE PLAGUE.

The Berlin official *Annalen der Landwirtschaft* publish the following "extract from a report" drawn up by two physicians who had been despatched to Russia by the Prussian government in September, 1884, to inquire into the state of the cattle plague then raging in some of its provinces:

"The tidings received from Russia of an epidemic disease which, travelling from east to west, had during the last three years shown itself in men and animals, especially horses, prompted the Prussian Government to despatch Herren Winkler and Dressler, two veterinary surgeons, to Russia in the September of last year, for the purpose of collecting on the spot scientific information as to the cause and nature of this epidemic.

"The Siberian plague, '*Yassa Sibirska*, or *Schalovaki*,' which by former Russian physicians was called the 'black sickness,' or the 'plague of boils,' but is now known in the scientific world by the name of '*pestis maligna*,' '*carbunculus*,' and '*hemitis*,' was most prevalent in 1884 in the well-watered low lands near Lakes Onega and Ladoga, and along the rivers Neva, Oka, Wolchoff, Tschoukka, Malloga, Kysma, Kuma, Wyatka, and Volga. The flat level plains, extending along these rivers, consist of meadow and pasture land, with a marshy and sandy soil, partly overgrown with low shrubs, and partly with pines and Scotch firs. However carefully you may seek, there is not a trace to be found of an artificial canal anywhere, and as the natural watercourses do not descend in a body of sufficient force, the water remained in a state of stagnation, causing the meadows to resemble more nearly enormous swamps than useful healthy pasture land. Only here and there do the larger rivers, where the shore is tolerably elevated, burst through the impediments opposing their course. Almost without exception the water of these rivers and canals is of a dark brown muddy colour. Hence there is also a very insufficient supply of pure water for drinking; wells of even the most simple construction are scarcely ever to be seen. The ships on these waters are drawn by horses, and as there is a pretty considerable traffic along the principal streams, many horses are constantly employed in this trying sort of work. Notwithstanding this, however, the shores of the streams are not in a condition to justify their being used for this purpose. The towing-path is alternately a villanous stone pavement or a muddy pool, materially increasing the labour required of the horses.

"The cultivated portions of these plains and those used as pastures for cattle are extremely small in comparison with their extent. Even the larger landed proprietors are of opinion that cattle of themselves bring in no material profit, but must be kept for the sake of the manure only. The cultivated tracts are lost amid the interminable plains of meadow, pasture, moor, and forest. Scarcely the tenth part of the surface is appropriated to agricultural purposes, although the soil from its chemical and physical properties, being composed of a most excellent and rich black earth, would yield a most profitable return. Indeed, on comparing this territory with similar tracts of land in Germany, the idea involuntarily presents itself that as yet the inhabitants are mere children, and have not got even through the A B C of culture.

"These low lands are only very scantily inhabited, the villages and estates, with the exception of those along the shores of some of the principal streams—as, for example, the Wolchoff—lying at a great distance from each other. The houses, which in the villages are chiefly of wood, are built quite close to each other in a double row, and two storeys high. Some few look tolerably comfortable, but mostly they are made to face any and all directions, bearing no signs of ever undergoing repair, though wood is left to rot along the roads. Even in the towns—as, for instance, Tver, on the Volga, where we changed horses—the small inns, having large courtyards and extremely roomy but low-roofed coachhouses, were almost rendered inaccessible by insurmountable masses of filth. In the stables there was a superabundance of dung. Altogether, agriculturists in Russia are at a very low ebb of civilisation. With some few good qualities, there still prevails among them

extreme ignorance, superstition, barbarism, disorder, and uncleanness. As they religiously observe every holiday in the Russian church, they sink into idleness, and consequently into poverty. The possession of large estates is not a guarantee of intelligence and economy in their management; there is no such thing, as with us, of the beneficial influence which a large enterprising landowner exercises over the smaller ones, by trying new experiments and introducing agricultural improvements.

"Although men and animals live in close proximity, kind feeling for the domestic creatures reaches only so far as is rendered indispensably necessary. So long as the country is not covered with deep snow they must seek their sustenance for themselves in the large meadows; consequently, they at times live in the enjoyment of great abundance, and at others with difficulty find the means of subsistence. In like manner domestic animals must alake their thirst wherever they can. This they do in the muddy water on the shores of the river, or in the hollow tracks left by the cattle. Proper troughs for cattle are not anywhere to be seen. In the winter they find but slight shelter from the snow and inclement weather in the ill-kept courtyards, in sheds, and in narrow dark places, where very insufficient food is given them, as the owner of cattle never aims at possessing anything like an adequate supply of winter provender. No sooner has the sun melted away the snow than the cattle are driven to the pastures, still inundated with water, where, exhausted by the starving process of the winter, they speedily consume what has been left from autumn, as well as the first buds of spring, which the rapid vegetation of that country quickly develops. As the herbage grows the temperature increases in warmth, and the exhausted animals have not sufficient stamina to oppose to the great extremes of heat and cold which day and night offer. Added to which, double work is required of the horses; for, on the one hand, there are the labours of the field which spring always brings with it, and which are universally done by one horse at a time, and, on the other hand, the rustics undertake to tow the numerous barges along the wide swampy rivers, and often against tide. These heavy vessels, which are nearly square, looking more like oblong chests than ships, and demanding in their towage an enormous waste of strength, carry as much as 40,000 cwt., and are laden with corn, stones, bricks, hay, and wood. The hard work of towing continues the whole day without abatement, and this for many days in succession, while during the short night, with heavy dews falling, the weary animal has to seek his food for himself. The work they have to perform is oftentimes so fatiguing that the poor creatures barely progress at a snail's pace, being only capable of putting one foot before the other, and requiring to be continually goaded on. Even loose horses find it difficult in autumn to overcome the difficulties which these unmade roads occasion. On September 29, when the authors of this report were travelling in the country, 2,000 horses were still engaged alone in towing the barges along the canal of New Ladoga to Schlüsselburg. On the Volga, near Tver, where a very active navigation and traffic prevails, each barge, mostly laden with hay and corn, had ten horses in a row to tow it along, while three men on foot, furnished with shrill whistles of a peculiar construction, were urging the animals to exert themselves to the utmost. A still greater strain is put upon such horses as are conveyed in the vessels themselves, sometimes to the number of 50, and who have to keep on at the labour for months together. Of these, 12 and more work at the same time at one single crank, to get the ship away by means of anchors sunk at a distance.

"The cattle have still less consideration shown them than the horses. Fewer of them are bred, as they are comparatively less profitable. Sheep and swine, which supply the population with food and clothing, live with the moujika, enjoying perfect liberty, but also exposed to the pernicious influences of the unhealthy climate.

"SPREAD OF THE YASSA.

"As early as the beginning of the 18th century the Yassa,

as stated in ancient documents of the Church, occasioned processions through the streets and prayers in the churches. To the same end a statue was erected at Tobolsk to St. Nicholas, which afterwards began to work wonders, and attained great fame among the orthodox. A little later, Pallas, Gmelin, Removats, and other scientific travellers collected more reliable information on the subject. Since 1740, when Gmelin discovered the first traces of the malady on the banks of the river Irtysh, where it had been prevalent long before, it has been a permanent scourge of Western Siberia, breaking out every year in the hot season, and chiefly killing men and horses. Sometimes more, sometimes less violent, it gradually spread beyond its original home, following in its course the rivers Irtysh and Tobol, as well as their tributaries, and affecting alike high lands and low lands, sand and swamp, and, indeed, every sort of soil and geographical situation. All domestic animals without distinction were liable to be attacked by it, but its most numerous victims were horses and men. Its appearance always followed closely on the advent of the hot season; cold weather, or a refreshing rain, as it counteracted the ravages of the mediæval plague, equally put a stop to the *Yasva*. In 1798 the *Yasva*, advancing further west than ever before, reached the Caspian Sea and Ukraine, penetrating at the same time as far as the White Sea in the north, and even showing itself in Lithuania and on the Russian shores of the Baltic. In the first half of this century the disease continued to exist in its original haunts, and, slowly progressing towards the east, made its appearance in the more remote districts of Siberia, as far as the Chinese frontier. In 1823 it visited the provinces of Kasan, Cherson, and Taurida, where it had never shown itself before, and raged at Charkow, Kasan, and all along the lower course of the Volga; but it is only in the last three years that it advanced again in a westerly direction, and infecting all the country from Astracan to Lithuania and Vitebsk, reached St. Petersburg, Olonetz, and the shores of the White Sea. Its principal victims on this latter occasion were horses; next, in point of numbers, came cattle; then sheep, swine, and, as the last in the scale of suffering, men. In some places all domestic animals were liable to be attacked; in others, horses and cattle only.

"According to official, though, perhaps, not quite reliable statements, the number of horses alone that perished of this malady in 1864 amounts to 72,309; but the loss is popularly estimated at 100,000. Of cattle 60,000 head succumbed in the same year. Looking at some of the provinces infected, we find 26,000 horses to have died in Novgorod, 12,000 in Yaroslavl, 4,860 in Olonetz, 4,109 in St. Petersburg, 4,000 in Tver, and 2,182 in Vologda. In six districts of the Province of Novgorod 13,888 horses, 4,800 cattle, and 2,308 swine and sheep died, while only 1,059 horses, 578 cattle, and 95 sheep and swine that had been attacked by the malady were saved. In some parts of the district of New Ladoga all horses employed in dragging barges were carried off; in other parts there were but few deaths, in some none at all.

"According to the same official sources, 938 persons were attacked by the *yasva* in 1864, of whom 303 died. In the above-mentioned six districts of the province of Novgorod, the number of deaths amounted to 207, and the number of persons saved to 860.

"No doubt the weather was particularly active in spreading the *yasva* in 1864. There had been much snow in the winter, but spring was late, and when it came at length rather hot. The snow then passing away rapidly, the water inundated the lowlands, and a luxuriant vegetation sprung up from the combined influence of heat and moisture. The air was close, oppressive, and impregnated with noxious miasmas. In the beginning of June the temperature rose on the banks of the Upper Volga to 30 degrees of Réaumur in the shade, while the nights were cool, and, in consequence of the over-charged state of the atmosphere, wet and dewy. Thus all tended to promote the spread of the murrain. On the 19th of June it broke out in the province of Vologda, on the 17th in the province of St. Petersburg, on the 22nd in Vladimir, on the 26th in Olonetz, on the 26th in Tver, on the 27th in Kostroma, on the 9th of July in Yaroslavl and Orel (where it ceased of itself after a week's duration), on the 26th in Wilna, and on the 27th in Moscow. It reached its climax from the 20th to the 28th of June, when the heat was at its height. On the temperature becoming cooler, the malady rapidly decreased, and in some localities disappeared altogether. From the 14th of July the

heat began to increase again, and with it the plague; but from the 20th, when a heavy rain purified the air, few or no fresh cases occurred. In September, when the authors of this report were travelling in the provinces that had so much suffered from it, the disease had already died away.

#### "DIFFERENT KINDS OF YASVA.

"There are two kinds of *yasva*, generally speaking, which may either occur separately, or both at the same time, and in the same locality. In the latter case a variety of intermediate stages have been observed by the physicians. The *yasva* is either an acute or apopleptic disease, when it kills its victims very rapidly; or it is chronic, when it is called diptheritic, or exanthematic, from the boils and swellings accompanying it.

"The apopleptic kind kills the animal in an hour and less. The animal suddenly begins to tumble, looks dull and stunned, cannot stand fast on its legs, breathes heavily, now and then emits a strange, half-involuntary sound, falls prostrate on the ground, and dies with or without spasms. As a rule no boils or blisters have been noticed in cases of this nature; though when death was a little longer delayed than usual incipient pustules might be discerned on the skin. The apopleptic kind is the rarer of the two, and always fatal.

"The exanthematic kind does not necessarily end in death. It begins with sudden and painful shiverings, which, after the lapse of an hour, are followed by the appearance of small pustules chiefly on the withers, breast, belly, udder, and penis, or, more rarely, on the ribs, hind legs, and crump. These pustules rapidly increase in size, penetrating deep into the cellular tissue. They are neither very hot, nor particularly painful; sometimes elastic, and allowing of being moved this way and that way with the skin, sometimes hard, fast, and sticking immovable in the body. On dissecting the animal, they are found to contain decomposed ingredients of the blood. As the pustules grow larger the animal begins to tremble, and becomes feverish and doleful. It stands quite still, with its eyes fixed, and its head hanging down. Notwithstanding the fever and its increasing violence, the appetite does not altogether cease, the normal functions of the body continuing at the same time much as ordinarily. In many cases horses have suddenly fallen to the ground, and died with food in their mouths. Death, which is the ordinary termination of this the milder species of the malady, as well as of the apopleptic one, ensues always within a fortnight, and, as a rule, without any premonitory warning. Recovery is initiated by a gradual discussion of the tumour, and the peeling off of the inflamed part of the skin, and the infected membrane.

"In some cases pustules have not been noticed until after the fever had already continued for some time. This species of disease always brought on death in a few days.

"The carcasses become rapidly putrid, emitting a horrible stench. The normal apertures of the body are frequently filled with sanguinary, frothy matter. At the beginning of the disease, the dead animals were frequently allowed to remain where they had breathed their last; or they were thrown into the rivers, and, being washed up to the banks, deposited in some stagnating pool by the current, whence they filled the air with pestilential vapour. It is said that St. Petersburg remained free from infection until a very large number of dead horses had been floated up to one of the metropolitan islands by the waters of the Ladoga Canal.

"The *post mortem* examinations of apopleptic animals showed abnormal secretions of blood in the cellular tissue, and near the lungs, the liver, and the spleen, which latter organ was very soft, spongy, dark-coloured, and turgid. The secretions were of a dark red colour, and mostly clotted.

"In cases of exanthematic *yasva*, the pustules were frequently of enormous size. At the bottom of the pustules there was always some yellowish edematous matter, which penetrating into the body from its outer circumference, pierced its texture, and even got as far as the great internal cavities and the organs disposed in them. The fat had always entirely disappeared, having been changed into that yellowish, edematous matter; and the blood was dark brown, like tar, and in most cases serous. The organs of the abdomen were full of dark-coloured blood and soft and spongy in texture; spleen and liver in the same condition, as in the cases of apopleptic *yasva*. If the seat of the pustule were in the pectoral cavity, the heart and lungs were similarly affected.



"There was little difference between the symptoms evinced by the carcasses of horses and cattle. Sheep are generally affected by the apoplectic form, and there is nothing reliable known as to the yasva of the swine.

"Among the human part of the animated creation the male sex is more liable to the disease than the female. In this case the symptoms of the malady, occasioned or manifested by the yasva pustule, are identical with those of the well-known disease, *pustula maligna*. Acute pain first indicates the spot where the pustule is to appear. A swelling of the skin ensues, and there is a reddish hue noticeable on and near the spot mentioned. At length a red point becomes visible, expanding gradually into a bluish blister, varying in size between a pea and a threepenny piece. These blisters have been observed on the face, throat, breast, arms, legs, hands, and feet. If there are but few blisters, and if they are small and confined to the arms, hands, and feet, the general state of the patient remains tolerably good, and the inflamed portion of the pustule being segregated from the rest, and falling off in course of time, recovery follows as a rule. In case of numerous blisters studding, however, the face and upper parts of the body, the state of the patient becomes feverish and typhoidal. A painful enlargement of the tumours is accompanied with headache, giddiness, and nausea, and death takes place after a few days, or even hours, in consequence of a putrid decomposition of the blood.

"It has been asserted by many peasants and village doctors in Russia that the contagion is not always communicated to man by animals, but will also attack men and animals at the same time. The fact might be accounted for easily enough by assuming the atmospheric and other local influences at work to poison the human as well as the animal organism under certain circumstances; and there are, indeed, cases recorded where the number of men and women infected exceeded that of the horses, while in other places human beings are said to have caught the infection long before the animals. As a rule, however, the contrary was the case.

#### "THE CAUSES AND CONTAGIOUS NATURE OF THE YASVA.

"As we have seen, the primary causes of the yasva must be sought in a variety of circumstances, peculiar to the locality—the low state of culture and civilization in those easterly parts; the many stagnating rivers and swamps evaporating noxious miasmas, and converting the air into a most injurious and oppressive sort of malaria atmosphere; the bad water used for drinking; the sudden advent of summer, and the rapid change of the weather from cold to warm and from warm to cold; the wet and swampy grasses eaten by the animals after the dry and scanty fodder given them in winter; and the excessive work to which the horses are put when the barge-dragging and agricultural season begins—all these are so many circumstances which cause the animals to catch cold very frequently, and which, by deteriorating the normal condition of the blood, increase their disposition for the prevailing disease. To these must be added the peculiar tendency of the Russian horses to suffer from congestions of the skin, a disorder frequently attended with the bursting of veins, or causing the animal to tear open with his teeth the vessels of the skin when heated. This tendency is nothing but the consequence of the want of proper cleanliness, and often ceases when the horse is tended and curried, as is the custom in other countries. Nothing, therefore, being more frequent than a sick, sensitive skin and the loss of blood from the capillary veins, we need not doubt that this is the very reason of the pustulous or exanthematic form of the plague committing such ravages among the poor neglected beasts.

"The plague being already extinct when the authors of this report were travelling in Russia, they had no means of testing the different opinions on the contagious nature of the yasva. The majority of the peasants and village veterinarians, supported by some of the learned doctors, contend that the disease is not contagious. Sick and healthy cattle, they say, had been frequently kept together without the latter being infected; and the village veterinarians who had never dreaded touching diseased animals, even though their hands might have happened to have open wounds and sores, had done so with impunity. Other peasants are, however, convinced that the contrary is the case, and that the disease is propagated by its victims. They observed, however, that in some places the plague did not break out until after the return of the horses from the river work, and that the cattle and other animals caught the infec-

tion from the horses. As to the experience of medical men, it undoubtedly goes to prove that persons attacked had come into frequent and habitual contact with sick and dead animals; that they had been engaged in curing or otherwise preparing for sale their hides, hoofs, and horns, or that they had only transported these articles from one place to another, or touched the stable utensils of diseased herds. As a rule, where the intellectual condition of the peasants was lowest, the yasva was most virulent among cattle and men; although it is but right to add that precautionary measures might have been more stringently enforced in most parts of the realm. Horses, for instance, although diseased, and sure to die within a few days, were put to work all the same, and frequently expired in harness. In the neighbourhood of St. Petersburg many hides of diseased horses were sold to the tanners and curriers, which led to their men being infected in great numbers, and not a few carried off by the disease. On the other hand, it is equally undeniable that persons were taken ill and got pustules who had never come into contact with diseased animals; that hospital attendants, whose duty it was to nurse a large number of the sick, were not infected; and that in some places a single animal would be attacked without propagating the contagion among the others.

"Wasps, infusorians, and a variety of harmless insects have been charged with spreading contagious matter, and it is not altogether improbable that the poison, in some cases, may have been communicated by the sting of a bee, or some other tiny animal of the kind. Indeed, some person would assert they had been stung by insects on the very place where the pustule subsequently showed itself. Suspicion principally attaches to the stinging and sucking species of breeze-flies, such as *Zabenus* and *Stomoxys calcitrans*, and the mischievous gnats of Kolubatz (*Rhagocolum lacensis*), which at times will appear in swarms in swampy localities.

#### "THE CURE OF THE YASVA, AND SANITARY MEASURES TAKEN TO PREVENT ITS SPREAD.

"The apoplectic species of the malady leaves no time for cure, and the means employed in cases of exanthematic yasva are, as a rule, without effect unless applied at a very early stage. People used to cut open the pustules when forming, to burn and cauterize the wounds with sulphuric acid and sulphate of trall; to apply cataplasms of dough, linseed, hayseed, and tobacco leaves impregnated with sal ammoniac; and also to keep the wounds cold, and put ice on them, if possible. In some cases peasants would apply ants' poultices, or foment the tumours with hot bricks and stones, so as to slightly burn the skin. Embrocations with a mixture consisting of 1-9th of creosote and 8-9ths of turpentine are also recommended as useful. Men and women have been frequently benefited by applying poultices saturated with vinegar of saturn and spirits of sal ammoniac in equal proportions directly the skin became painful and a tumour visible.

"As a precautionary measure it was formerly prescribed to kindle large fires, the smoke of which was intended to kill noxious insects and warn off travellers.

"On the late appearance of the epidemic in Western Russia, 80 veterinary surgeons—a large number, when the scarcity of professional men in the country is taken into account—were sent to the infected provinces by Government. But although instructed to offer assistance and medicine gratis, their activity was not attended with any remarkable result.

"We may also mention that it was only after the plague had been raging for some time, that people were ordered to bury the carcasses at once, and in deep pits.

"The supervision of domestic animals by Government physicians, as exercised in the ordinary routine of business, is no guarantee against the spread of contagious diseases. A herd is simply driven past a Government physician, counted, and the number compared with that mentioned in the passport. How, then, is it possible for the physicians to distinguish the sick from the healthy? The authors of this report heard a woman say that she had washed off the purulent matter from the nose and eyes of an infected cow just before the arrival of the medical man. In no case have diseased animals been killed by order of the Government, or indemnification offered to owners who should kill them of their own accord.

"We believe ourselves justified in inferring from the above that the yasva is not a new and distinct malady, but only a peculiar species of the well-known *Liemitis*, or inflammation of

the spleen, which has been frequently witnessed in Europe and America under local circumstances similar to those of the Russian plains. The authors of this report had the satisfaction of seeing their view of the case adopted by Herr Haupt, the

famous chief veterinary surgeon of the Government, who, having represented the Yassa as a distinct malady in his work on epidemics among animals, after rediscussing the subject with them, now classes it with Lienitis."

## AGRICULTURAL REPORTS.

### GENERAL AGRICULTURAL REPORT FOR AUGUST.

Although the temperature has been tolerably high, the progress of harvest work in all parts of the United Kingdom has been very slow. Immense quantities of rain having fallen, the grain has remained in the fields some time after being cut, and much of it has been carried in a damp state. The wheat trade has, therefore, shown signs of firmness, and an advance of from 2s. to 3s. per qr. has taken place in the quotations. At that amount of improvement, however, the business doing has been only moderate. Millers generally are aware that the stocks of old wheat on hand are large, and that very extensive supplies of foreign have been purchased for immediate shipment to England. It is, however, very evident that for several months really fine wheat will be comparatively scarce and high in price, although it is admitted on all hands that the yield of the new crop as to quantity is nearly, or quite equal to last season. Nearly the whole of the growth of barley has been secured in our forward districts. The yield is certainly a full average; but most of the samples show a great want of quality; hence, fine parcels have been held for more money, and enhanced rates are anticipated during the coming season. The produce of the oat crop is even smaller than was at one time anticipated. We shall therefore be chiefly dependent upon supplies from abroad to meet the consumption. Beans and peas are a very middling crop, though certainly larger and of better quality than last year.

From the above remarks it is obvious that both wheat and barley have seen their lowest range for some time; but we are not prepared to say that there will be any excitement in the demand. Continental and American advices are opposed to any great activity in the trade. The produce of the crops is represented as large, but not of very fine quality. The prices at which it is offered are considered low, and we could be readily supplied with wheat at rates which would leave a fair margin of profit in this country.

The crop of potatoes in almost every county is proving unusually large, and, with some few exceptions, wholly free from disease. The great abundance of the growth, and the low prices, 50s. to 100s. per ton, at which it is offered, must to some extent have a controlling influence upon the value of the better kinds offered. On the continent the crop is certainly not equal to some former years. The probability is, therefore, that the importations during the winter months will be on a very moderate scale.

The turnip crop is a partial failure; but, where successful, it is very large. Swedes, mangolds, &c., promise the largest return ever known; indeed it is doubtful whether they can possibly be consumed, owing to the small numbers of stock in the country.

It is a fortunate circumstance, however, that the supply of food is large at a time when butcher's meat is very high in price. An abundance of keep will tend not only to fatten the stock somewhat rapidly, but likewise to allay the present excitement caused by the spread of disease in various localities. The great abundance of food will, likewise, materially lessen the feeders' outlay for linseed and cake.

Notwithstanding that the heavy rains have produced mould in some localities, the growth of hops in Kent, Sussex, &c., is likely to turn out unusually large, and of good quality. New qualities have been disposed of in the Borough at from 140s. to 180s. per cwt. As the stock of olds and yearlings is nearly exhausted, present rates are considered safe for fine parcels.

The advance in the Bank rate for money to four per cent. has somewhat checked the demand for English wool; nevertheless very little change has taken place in the quotations. The public sales of Colonial qualities, which, in the aggregate, will amount to nearly 140,000 bales, have progressed steadily.

Really fine qualities have changed hands freely at full prices, although the demand on continental account has been inactive when compared with the previous series. Inferior and faulty wools have given way 0½d. per lb. The improved demand for woollen goods in America is likely to bear considerable influence upon our manufacturing trade for some time.

The first cut of hay has at length been secured. It has certainly exceeded last season, and the second cut in the southern and eastern districts has been somewhat heavy. Meadow hay has sold in London at from £4 15s. to £6 10s., clover £5 to £7, and straw £1 8s. to £2 2s. per load. The pastures have presented a most luxuriant appearance, and much difficulty has been experienced in keeping down the grass.

The crop of apples is a partial failure, but the growth of most other kinds of fruit is very large. The deficiency in the crop of apples will be severely felt in our cider districts.

In Ireland fair progress has been made in harvest work. Wheat and barley are about average crops, but other produce presents a deficiency. The various markets have been scantily supplied with grain, for which the demand has ruled steady on rather higher terms.

The harvest in Scotland is tolerably forward, much less rain having fallen than in England, and most accounts agree in stating that wheat, barley, and oats will be fair average crops, though not of fine quality. The growth of potatoes is enormous, and it is expected that very large shipments will be made to the south during the winter. As a whole, the crop is free from disease.

### REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Much excitement has prevailed throughout the country, owing to the spread of disease amongst cattle in various quarters. Every precaution has been taken to prevent contamination—diseased animals have been seized in large numbers, and inspectors have been appointed with adequate powers to condemn meat unfit for human consumption. The losses amongst the cows in the metropolitan dairies have been serious, and it has been found necessary for the Privy Council to stop the export of cattle to Ireland. These precautions have certainly become necessary, because we do not hesitate to say that the new disease which we term gastric fever is an importation from the continent. We do not suppose that the import of foreign cattle will be prohibited; but our advice to the graziers is, not to purchase foreign store animals for grazing purposes, and to the dairyman, to avoid mixing foreign cows with English breeds, although they may give an immense quantity of milk. If our views are carried out we shall hear very little more of disease in any quarter.

Fair average supplies of beasts have been on sale in the London market, but at least two-thirds of them have been beneath the middle quality. Prime Scots, Devons, Herefords, northorns, &c., have changed hands freely, at very full prices. All other kinds have moved off heavily, on rather lower terms. Foreign store beasts have been offered as low as 2s. to 2s. 6d. per 8lbs.

The numbers of sheep brought forward have been moderately good, but mostly in poor condition. Prime Downs, half-breeds, &c., have sold freely, at enhanced quotations, and even the most inferior breeds have realized extravagantly high rates. The lamb trade has been devoid of animation; nevertheless, prices have been supported.

In the value of calves very little change has taken place; but pigs have produced more money. The prices paid for the latter in some parts of the country have been unusually high.

The imports of foreign stock into London have been as follows:—

	HEAD.
Beasts ... ..	16,536
Sheep ... ..	54,333
Lambs ... ..	6,727
Calves ... ..	3,287
Pigs ... ..	8,251
Total ... ..	89,184

## COMPARISON OF IMPORTS.

	Beasts.	Sheep.	Lambs.	Calves.	Pigs.
1864 .....	11,475	89,114	2,716	2,786	4,336
1863 .....	9,503	84,937	4,185	4,537	4,108
1862 .....	5,680	80,652	5,304	2,080	3,297
1861 .....	6,581	83,210	3,176	1,874	3,718
1860 .....	6,647	88,349	1,856	2,530	4,075
1859 .....	6,503	89,175	3,808	3,264	1,905
1858 .....	2,993	19,500	2,764	3,513	2,935
1857 .....	4,692	21,315	1,760	2,661	2,823
1856 .....	5,677	17,801	1,371	3,301	1,901
1855 .....	8,341	28,805	984	3,484	3,476

The total numbers of stock exhibited in the Metropolitan Markets were as under:—

	HEAD.
Beasts ... ..	29,600
Cows ... ..	170
Sheep and lambs...	147,580
Calves ... ..	8,328
Pigs ... ..	2,176

## COMPARISON OF SUPPLIES.

	Beasts.	Sheep and Lambs.	Calves.	Pigs.
1864 .....	29,420	154,300	3,496	3,046
1863 .....	26,264	149,430	3,070	2,632
1862 .....	24,073	154,920	3,354	3,013
1861 .....	23,420	159,740	2,952	3,220
1860 .....	22,390	151,500	3,546	2,070
1859 .....	23,170	168,090	3,322	2,320
1858 .....	26,915	151,530	2,127	3,510
1857 .....	20,695	143,758	3,173	2,450
1856 .....	21,271	147,250	3,354	2,875
1855 .....	20,818	151,870	3,566	4,272

This district supplies thus compare with the two previous years:—

	Aug., 1863.	1864.	1865.
From Lincolnshire, Leicestershire, & Northamptonshire	14,000	13,500	9,820
Other parts of England	4,000	3,700	3,000
Scotland	101	138	789
Ireland	560	297	530

The comparison of prices stands thus:—

	Aug., 1860.	Aug., 1861.	Aug., 1862.
Beef from	s. d. s. d.	s. d. s. d.	s. d. s. d.
3 0 to 5 6	2 10 to 4 10	3 4 to 4 10	3 4 to 4 10
Mutton ...	3 8 to 5 6	3 2 to 5 4	3 8 to 5 4
Lamb.....	5 4 to 8 6	5 0 to 6 0	5 0 to 6 4
Veal .....	4 2 to 5 6	3 4 to 4 6	4 0 to 5 0
Pork .....	4 0 to 5 0	3 10 to 4 8	3 8 to 4 10
	Aug., 1863.	Aug., 1864.	Aug., 1865.
Beef from	s. d. s. d.	s. d. s. d.	s. d. s. d.
3 4 to 4 10	3 4 to 5 0	3 0 to 5 6	3 4 to 6 8
Mutton ...	3 6 to 5 2	3 10 to 5 4	4 4 to 6 8
Lamb.....	5 0 to 6 8	5 8 to 6 8	6 0 to 7 0
Veal .....	3 4 to 4 8	4 0 to 5 0	4 2 to 5 4
Pork .....	3 6 to 4 6	3 6 to 4 6	4 0 to 5 0

The supplies of all kinds of meat on sale in Newgate and Leadenhall have been very moderate. Prime qualities have changed hands freely, at full quotations; otherwise, the trade has been in a most inactive state. Beef has sold at from 3s. 4d. to 4s. 10d., mutton 4s. 4d. to 5s. 10d., lamb 5s. 4d. to 6s. 4d., veal 4s. to 5s., and pork 4s. to 5s. 4d. per 8lbs., by the carcase.

## NORTH LINCOLNSHIRE.

The crops are being rapidly ingathered, although much impeded by the late rains. Sprouted wheat is spoken of freely; and potatoes, in the Isle of Axholme, are said to have suffered

greatly from the rain-storms. Turnips seem to have reaped a peculiar advantage from the wet weather, which after Monday ceased; but, until then, was almost incessant. Mangolds generally look well, especially so on heavy land. Potatoes on the Wolds are in prime condition, and realizing £16 to £17 per acre, to be taken up and paid for in October, with the usual ten or twelve days' grace. The cattle murrain has not at present made a sign in this locality; the railway officials, acting up to the instructions of the Board of Trade, are busily occupied in remedial measures, so far as the transit of stock on their lines is concerned. This is evidently a capital plan. The cattle-trucks are lime-washed, and the dose is repeated after any of them have been used by foreign stock, and in some cases by suspicious-looking animals passing through our own locality. At Hull, which is the chief port for cattle from abroad, and transhipped in our neighbourhood, the authorities are on the alert, and every care is shown by them in the examination of stock, and placing any suspicious-looking beast in quarantine; but at present there has not been any case at all analogous with the Russian rinderpest, and no case indeed calling for any special application for veterinary skill.

AGRICULTURAL INTELLIGENCE,  
FAIRS, &c.

**ASHFORD LAMB FAIR.** (Tuesday last).—The supply was about an average, and for good lots a brisk trade was done at high prices, but very few remaining unsold at the close.

**BEDFORD FAIR.**—A poor show of fat cattle; those sold made from 11s. 6d. to 12s. per score pounds. Best half-bred wethers made from 8d. to 9d., ewes from 7d. to 8d. per lb.; good tegs sold at from 35s. to 40s., lambs from 30s. to 32s. each. Small fat porkers made from 7d. to 7½d., large 6½d. to 7d. per lb.

**BODMIN FAIR.**—The following prices were made: Fat cattle 23 5s. to 23 10s. per cwt., Sheep 7½d. to 8d. per lb. Store cattle made good prices. A brisk sale throughout the day.

**BRACKNELL FAIR.**—The supply of horned cattle was very large, and in a healthy condition. There was a good demand for fat beasts, which sold at from £18 to £24 each, and store stock for grazing were in request, well-grown steers selling at from £13 to £15, and heifers at £10 to £12. In most instances a warranty was required against existing disease. Among dairy cows there was but little business transacted; for although dairy farms are being greatly increased in this county for the transmission of milk to London, yet the cattle plague, which is so fatal among milch cows, deters country dairymen from buying fresh stock. However, the prices made were from £17 to £23 each. Many droves of lean and store cattle were not sold. In the horse fair there was a good sale for best descriptions of animals, some realizing 35 to 40 guineas.

**COCKERMOUTH FAIR.**—The general average price given for lambs was 17s. 6d., but 18s. and 19s. a-piece were obtained in some instances. Half-bred Leicesters were sold at 17s. to 35s. each, but went off slowly at the latter figure; the more improved breeds realized 36s. to 32s. each, and several lots were sold. Pure-bred Leicesters were scarce, and sold at 40s. to 50s. each. A sum of £2 15s. was asked for one, but no purchaser was found. Mr. Robinson Mitchell sold a lot of half-bred Leicesters at 24s. 6d. each. There was a small lot of Irish wethers shown, but they were not sold; 50s. each was offered for them, but refused. Ewes were bought at 52s. and 55s. each, but transactions were few. The supply of cattle was confined to a few lots of Irish two-year-old heifers, which realized 26 to 27 a-head. Upon the whole the prices were considerably in favour of sellers, and though buying was not brisk, before the fair concluded a large business was done.

**CREDITON FAIR.**—There was an average supply of bullocks; sheep, above average. It was a "selling market," and cattle fetched rather high prices. Sheep sold at 8d. per lb.

**GLOUCESTER MONTHLY MARKET** was moderately supplied with fat cattle. The quality generally was rather inferior, but trade was firm at advanced prices. The supply of sheep and lambs was short, and the demand was consequently active. A clearance was soon effected. The prevailing prices were—Beef, 7d. to 8d.; mutton 8½d. to 9½d.; lambs, 6d. to 10d. per lb.; pigs, 10s. 6d. to 11s. per score.

**GRANTHAM FAT-STOCK MARKET.**—A small show compared to late markets. Trade brisk. Beef 5s. 9d. to 1s. per stone, mutton 8d. to 9d. per lb.

**HINCKLEY FAIR** was the duller ever observed in this town. Almost impossible to state the prices given. Fat cattle were sold at an advance of from 1s. to 2s. per score pounds.

**IPSWICH LAMB FAIR.**—The cattle disease, no doubt, affected both the attendance and the supply. The Corporation had taken every precaution that no diseased cattle should reach the fair. An inspector was stationed at every approach to the field, and on every road, whether highway or by-way. As yet sheep and lambs have been considered safe from the infection; but, nevertheless, there were fewer pens than usual. Trade was brisk among the sheep. Lambs made 35s. to 37s., blackfaced ewes 60s. to 70s. 6d., half-breds 50s. to 60s. Fat beef fetched 9s. to 9s. 6d. per stone.

**LANARK SECOND LAMB MARKET** brought together a large gathering of dealers from various parts of Scotland, and a few from Ireland and the bordering counties of England. The morning dawned fair, and excepting a shower which fell during the forenoon, the weather was favourable for the transaction of business. The number of lambs was upwards of 16,000, which added to those sold the previous evening, would run up the total show to 20,000 head—the largest number that has been brought forward at the second lamb market for many years. The condition of all the lots was fair, though some were perhaps more unequal than usual, owing to the severity of the winter. In the afterpart of the day blackfaced wether lambs could not be sold at all, and a great many lots failed to find new owners. Blackfaced ewe lambs would be up from 2s. to 3s. on the prices of the corresponding market of last year, and Cheviot ewe lambs from 1s. to 1s. 6d. Blackfaced wether lambs were back from 1s. 6d. to 2s. on the prices of the market held at Lanark a fortnight ago. Cheviot wether lambs also declined in value, and compared with the rates going at Lockerbie last week, they indicated a fall of from 1s. 6d. to 2s. Crosses fetched nearly the same money as at recent markets. Blackfaced ewe lambs sold at from 18s. 6d. to 24s. clad, wether lambs at from 16s. downwards; Cheviot ewe lambs, seconds at from 17s. to 20s., and wether lambs at from 16s. to 22s. each.

**LINCOLN FORTNIGHTLY MARKET.**—A good show of beasts, but a thin supply of sheep. The former made 8s. 6d. to 9s. per stone, and the latter from 8d. to 9d. per lb.

**LUDLOW FAIR.**—There was a numerous attendance of dealers; but the number of sheep was not so large as last year. Fat sheep averaged 8½d. per lb. Store sheep sold briskly. The pig market was remarkably high, fat porkers fetching from 6d. to 8½d. per lb. The supply of cattle was comparatively unimportant, this being essentially the sheep-fair of the year. Fat beasts, of which there were very few, realized 7d. to 7½d. per lb. There was a poor show of horses. Cart-horses were sold for £20 to £23 each. Of those of an inferior description but few changed hands.

**MARLBOROUGH FAIR.**—Most of the pens of ewes and lambs were in prime condition, and met a ready sale, at an advance of from 10s. to 12s. per head on last year, and fully 5s. per head in advance of Briftord Fair. There were several strings of good cart-horses, and cobs in great variety. Cows met rather a dull sale; but there were large numbers offered. On the whole, the sale was good, at greatly-enhanced prices.

**MARTOCK FAIR.**—The attendance was not so large as was expected, owing, no doubt, to the fine weather. There was, however, a good number of fat beasts, which sold well. Sheep and pigs fetched very high prices.

**MELTON FAIR.**—Owing to the prevailing epidemic, the pitch of beasts was smaller than on any previous occasion. Only few store cattle were offered. Meated beasts were in good supply, and found ready purchasers at very full prices, especially for prime quality. In-calfed beasts were very slow of sale, at reduced prices, none being at present required for the London trade. The pitch of sheep was larger than usual, especially of store lambs, prices for which ranged as high as 40s.

**MONZIE LAMB MARKET.**—There was a great deficiency compared with the corresponding market last year. The high prices asked by holders in the morning would not be acceded to by buyers, and consequently the day was well advanced before many sales were effected. About ten o'clock sellers gave way a little; and immediately afterwards a considerable

number of the best lots were picked up at the sub-joined prices: Mr. Hugh M'Laren, Dunnichen, sold his best lot of cross-bred lambs at 23s. per head, and seconds at 19s. each. Mr. John Wilson sold the top lots of the Moreish Cheviot lambs at rates ranging from £23 to £25 per clad score. The inferior lots brought prices varying from £16 10s. to £20 per clad score. Mr. Wilson also sold the Claggion lambs, Lochtayside, which consisted principally of blackfaced stock. The top price was about 20s. per head; seconds ranged from 15s. to 18s. each. The current prices of cross-bred lambs ruled from £20 to £22 per clad score. Blackfaced lambs formed a large portion of the stock, and numerous lots of small inferior lambs were shown. Mr. Thomas Patton, Glenalmond, sold his best lot of blackfaced lambs, to go to Kinross, at £17 per clad score, and seconds at £15. Mr. Duff, Berryhill, sold his blackfaced lambs to the same gentleman at similar rates. The other lots of the blackfaced stock brought about the same rates, and some inferior lots ranged from £8 to £11 per clad score. Prices generally ranged from 4s. to 5s. per head higher than last season.

**NEW ROMNEY LAMB AND WOOL FAIR.**—There was a brisk demand for lambs, some of which changed hands at the highest prices ever known. The average was about 29s. per head, but a great many fetched 34s., and as high as 36s. per head. There was not much doing in wool, though there were several buyers present. The highest prices offered were £23 per pack for Kent fleeces, and £15 for lamb wool. Flockmasters held for £24 per pack for fleeces, at which price a large quantity was offered.

**NORTHAMPTON FAIR.**—Scarcely anything selling: no dealers or graziers. Some fat Beasts were disposed of, but at very high prices, so extravagant, that they cannot be sold at a profit for less than 9d. or 10d. per lb.

**OLD BAYNE FAIR.**—Like all the other markets at present, the turn-out of cattle was small. Fat beasts sold at 70s. per cwt. Mr. Brown, Knockolochy, sold 4 stots at £23 10s.; Mr. Middleton, Clatt, a pair of stots for £40, and a pair of queys for £27 10s.; Mr. George Hay, Netherhall, a pair of prime queys for £54 10s.; Mr. Wilson, Moss-side of Newton, three at £17 10s.; Mr. Edwards, Wellheads, sold 4 yearlings at £11 10s. Mutton fetched 7d. to 8d. per lb. Mr. Grant, Drumbulg, sold wethers at 25s.; Mr. Singer, Williamston, a lot of ewes at 21s.

**PENRITH FORTNIGHTLY MARKET.**—Beasts were in demand, but the rates remained unchanged. Average prices: Beasts 7s. 6d. to 8s. per stone, sheep 7½d. to 8d., lambs 8½d., and calves 8d. to 8½d. per lb.

**SETTLE FAIR** was well supplied with sheep and lambs, and the attendance of the trade was numerous. A heavier demand than usual was experienced, but the prices were about the same.

**SHAFESBURY FAIR.**—About 3,000 sheep were penaned, which readily changed hands at high prices. Lambs made 38s. to 50s. the head, ewes 48s. Of stock there was not much shown, but there was a ready sale at high prices.

**STROUD FAIR** was unusually "slow." Very little stock was shown, but that disposed of realized high prices.

### MR. RIGDEN'S SOUTHDOWN SALE.

The annual sale and letting of Mr. Rigden's Southdowns took place at Hove on Friday last. The day was very fine, and there was a large attendance of flockmasters, both from the county and other parts of England. The ewes, principally four-shear, and 100 in number, were sold in lots of five, and averaged £2 18s. The highest-priced lot of ewes were bought by Mr. Harris, of Chichester, at £5 10s., and the second priced lot for Miss Talbot, of Gloucestershire, at £4 15s. Out of the 30 rams which were in the catalogue, seven were sold at an average of £15 5s. 10d., and ten were let at £15 11s. 6d. The six-shear Battersea gold medal sheep, which has now made about 300 gs. in lettings, was let to a "Shrop" flockmaster, Mr. Green, of Great Marlow, who also hired another at 18 gs., and bought four at 11 gs., 11 gs., 15 gs., and 23 gs. Mr. Tomline, M.P., hired three, at 20 gs., 15 gs., and 15 gs.; Mr. Turner, of Chyngton, hired one at 20 gs.; and his Grace the Duke of Richmond another at 16 gs. Messrs. Humfrey, Selby, Symes, Fidler, Croakey, Harris, &c., also hired sheep. The great feature of the sale was the demand for tups to cross with "Shrops."

## REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

"Rain in harvest" has ever been a terror to husbandmen, from the patriarchal age down to the present; and we regret to make an unfavourable record of the character of the past month. The fear in July and in the previous months was drought, and the traces of its effects have still been left in a deficient crop of oats and a light one of hay; but the month just passed away was without seven days' consecutively fine weather. The bean crop, indeed, if well harvested, has been made by the copious fall, and esculents have become luxuriantly fine; but the potato disease has certainly sprung up among the later sorts, and the bulk of the corn crops has sustained much damage as to condition, while the quality of the wheat was very various previously, from the unusual fluctuations of temperature. The samples of new that have hitherto appeared create but sorry forebodings as to the entire yield; but, happily, there are exceptions, and perhaps farmers, anticipating the improved value of everything fine and dry, have kept these back for yet better markets. Nor can we blame those who have the good fortune to possess them, for so doing. We scarcely like any further reference to disasters; but accounts from Poland (once the granary of Europe) are doleful in the extreme, and we hope they are exaggerated, for hail as well as rain have come down heavily on the corn in that country, and almost driven farmers to desperation. In France, too, they are decidedly short this year, as well as in Southern Russia, while the Western States of America have suffered so severely as to give birth to speculation in New York, at advancing rates. But if we go a step further in the catalogue of woes, we must face something still more to be deplored—"that terrible cattle-plague," which has come as the most dismal heritage of free-trade, and fastened upon us with such a grip that the whole island is in consternation, from north to south. As there is, however, one Being who can control the elements, and stay the plague effectually, let us hope that both will cease at His merciful command, and confidence in His goodness ultimately fill the land! We need not, however, say much in referring to what has already happened, in vindication of our opinion that very low prices for corn seem next to impossible. The following rates have lately been quoted at the places named: The best wheat at Paris, which has now become one of the cheapest markets, was quoted at 45s. per qr., red at Antwerp 47s., Zealand wheat at Maastricht 44s., red qualities at Hamburg 46s. 6d. per qr. The best old highmixed Polish at Dantzic was held at 58s., cost, freight, and insurance included; red at Cologne, 43s. per qr., at Straubing 36s., at Venice 37s. per qr. Floating cargoes of Gbirka from Odessa have been placed in quantity at 43s. per qr., Berdianski 43s. 3d. per qr., Wallachian 37s. per qr., red at Stral-

sund 40s. 6d., Stettin 43s.; spring wheat at Chicago, 28s. 3d. per qr. of 480lbs. New York quotations note the value of Milwaukee Club at about 35s. per 480lbs, amber Western 36s. per 480lbs., winter 48s. 3d. per 480lbs.

The first Monday in Mark Lane opened on small English supplies of wheat, with moderate arrivals of foreign. The show of samples this morning from Kent and Essex was scanty, and with the return of rain the market closed 2s. to 3s. per qr. dearer; but the latter advance was made with difficulty. Foreign also improved 1s. to 2s. per qr., the qualities most in demand being good dry Russian. Cargoes off the coast improved in value fully 1s. per qr. The varied character of the weather through the week similarly affected the several country markets; those held early followed the London rise of 2s. to 3s., then 1s. easier terms were accepted; and as the close brought more rain, there was again some enhancement of values. Wheat at Glasgow was 1s. per boll higher, and the rise at Edinbro' was 1s. to 2s. per qr. Holders of foreign in the Irish markets insisted on higher prices; but not much business was done.

On the second Monday the English supplies were scanty, but the foreign liberal. The morning's show from the near counties was moderate, with a good proportion of new, poor in quality and condition. Old samples were still dearer, say 1s. to 2s. per qr.; but the sale was not brisk; new continues quite neglected, as unserviceable to millers. A fair amount of business was passing in foreign, at a further improvement of 2s. per qr., Russian sorts again being in principal request. The floating trade was also improved to the extent of 1s. to 2s. per qr. The weather being again very catching, and the several country markets affected accordingly, many were 2s. to 3s. per qr. dearer, though little reliance could be placed in the stability of so sudden a rise. Liverpool on Tuesday was excited, but calmed down again on Friday. Glasgow noted an improvement of 1s. 6d. to 2s. per boll, and Edinburgh was 1s. to 2s. per qr. dearer. The advance paid at Dublin on foreign samples was fully 1s. per barrel.

The returns of the third Monday were small, both in English and foreign qualities. The morning's show was also scanty, with but a small proportion of old. These latter sold at the value of the previous Monday; but new were exceedingly difficult to dispose of, from their inferiority and unfitness for milling. The foreign trade remained firm, but no advance could be quoted. With the weather somewhat improved, there was less demand for floating cargoes, which were 1s. per qr. cheaper. Though Wednesday was a pouring day, and very damaging, as some of the days intervening were very hot and fine, a good deal of corn was carried, and there was not the same universal advance,

many places quoting no higher prices; but the majority were 1s. to 2s. per qr. dearer, thus making the country dearer than London, and the markets held on Saturday were generally of this upward tendency. Glasgow made no alteration. Edinburgh was 1s. per qr. dearer. Dublin was only firm, no further advance being practicable.

On the fourth Monday the English supplies were but moderate, though there was plenty of foreign. There was a rather better supply this morning from Essex and Kent, mostly new, the condition of some of which was little above that of grains. The upward movement had then ceased. Even old English samples did not sell freely, though only the former Monday's rates were demanded, and new, from being worse conditioned, were of very doubtful value, though occasionally a fine parcel was offered for sale at about the price of old. The foreign demand was less brisk; but Friday's advance was insisted on for all fine dry Russian sorts, such as Saxonska and Gbirka; but secondary quality Danzic was not dearer, and the demand slackened for floating cargoes as well, with prices below those of Thursday.

The imports into London for the four weeks were, in English qualities, 15,035 qrs.; in foreign, 74,307 qrs., against 15,989 qrs. English, 72,689 qrs. foreign in 1864. The London averages commenced at 46s. per qr. and closed at 48s. 4d. The general average opened at 42s. 10d. and closed at 43s. 1d. per qr. The imports into the kingdom for the four weeks, ending 10th August were, in wheat 1,753,805 cwt.; in flour, 268,852 cwt. There were no exports of wheat or flour from London.

During the past month the flour trade passed from a state of extreme depression and dullness into one of full activity, with a corresponding advance. Business in Norfolk and all country descriptions had previously been at the lowest ebb, the manufacture entailing almost certain loss, but every market-day noting an improvement of 1s. per sack. Norfolk have become fully worth 33s., some holding for more; while barrels, notwithstanding their relative dearth, have gained 2s. per barrel. Town millers raised their top price on the 14th to 43s., at which it has since stood. The stock of barrels in London is very reduced, and the rise at New York is not favourable to large imports. The imports into London in four weeks were 53,905 sacks English, 2,174 sacks 19,105 barrels foreign, against 40,966 sacks English 1,406 sacks 56,332 barrels foreign in 1864.

The barley trade during the month has been on a small scale, the season not having yet commenced, and the arrivals of new malting being hitherto extremely scanty; but prices have gradually hardened for all kinds, in consequence of the smallness of stocks and the roughness of the weather, foreign Baltic having improved in value 1s. to 1s. 6d. and low grinding about 2s. per qr., Danube being worth 22s. to 23s. per qr. As much barley has been out in the rain, fine bright quality for malting is likely to be very scarce, and full prices paid for it; but there must of necessity be much that will prove discoloured and coarse, which may weigh upon the markets. Not much dependence can be placed on foreign this season to

supply any deficiencies of our own, as Northern Europe, like ourselves, has had much wet. The imports into London for the four weeks were 855 qrs. English, 12,168 qrs. foreign, against 1,110 qrs. English, 11,880 qrs. foreign in 1864. With the weather so much against the barley crop, malt has been steadily advancing in value, till fine qualities have become worth 66s. per qr.

The past month, like its predecessor, has been extraordinary for its imports of foreign oats; but with the weather damaging to the small crop on the ground, the market has borne the unusual pressure well, not having given way more than 1s. per qr., a decline of 6d. per qr. taking place on the second and fourth markets. Fine 40lb. Danish and Swedes are now worth about 22s. 6d. per qr., and Russians in proportion; so, if there be any falling off in the foreign supplies, we expect this last 1s. will be recovered: but as yet there is no sign of it. The imports into London for the four weeks were—in English sorts 1,594 qrs., Scotch 1,952 qrs., Irish 455 qrs., and foreign 271,643 qrs. (half of which arrived on the fourth Monday), against 2,954 qrs. English, 40,094 qrs. Scotch, 14,127 qrs. Irish, and 229,495 qrs. foreign for the same period in 1864.

Beans have been very steady through the month, being all along high priced; but on the fourth Monday they advanced fully 1s. per qr., some of the new crop being cut, and reported to be damaged by the wet weather. This grain, however, is too high for speculation, and as they have a crop of Maize in America this year, and shipments have been coming forward for Ireland, we may see some decline if the bulk of the crop escapes damage, or should only be damp. Egyptian have lately been selling freely at 38s., and Mazagans at 40s.. The imports into London for four weeks were—1,937 qrs. English and 5,691 qrs. foreign, against 2,358 qrs. English and 1,451 qrs. foreign, in 1864.

Though the trade in peas has been small, prices have been gradually hardening, old foreign having followed the value of beans, and new coming as yet in too small quantities to lower prices. Fine new boilers are worth about 42s., but extra foreign are held for more—grey at 36s. to 37s., and the other sorts in proportion. The imports into London for the four weeks were 910 qrs., exclusively English, against 1,896 qrs. English and 4,204 qrs. foreign for the same period in 1864. With a rise in wheat and flour, and probable advance in meat, it seems likely that fine boilers may improve in value as Christmas approaches.

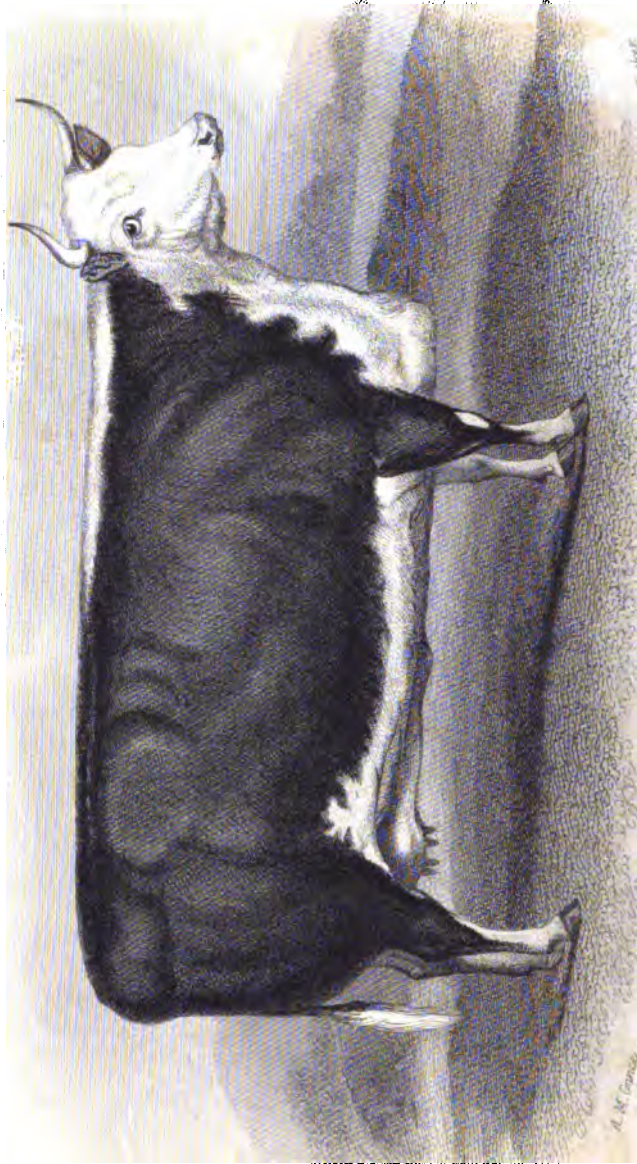
With good arrivals of linseed at the commencement of the month from India, and some dullness as the consequence, prices eventually hardened again, both for seed and cake, and the price which well-fed cattle now readily make prevents much probability that rates will decline, more especially as the crops abroad have been reported as deficient.

The seed trade has been in a state of abeyance in consequence of the doubtfulness of the weather. The high prices at which the small stock of clover-seed left off at the close of the season, has prevented any speculative inquiry; but holders with









*Spangle 2nd*  
*Prof. Higgins has the animal at the Academy of Washington. Taken in 1890.*



*2. 1/2 ft. 4. 1/2 in. long*

*London, England, by the Rev. Canon of St. Paul's, 1865*



# THE BRITISH FARMER'S MAGAZINE.

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## PLATE I.

### SPANGLE 2ND; A ROYAL PRIZE HEREFORD COW.

Spangle 2nd, bred by the late Mr. Rea, of Monaghty, and calved on September 16, 1859, is by Wellington (1112) out of Spangle, by Chieftain (930), her dam Young Venus by Cholstrey (217)—Venus by Albert (330)—Countess by Old Court (306).

Wellington, red with a white face, bred by Mr. P. Turner, of The Leen, and calved September 23rd, 1851, was by Duke, a son of Northampton (600), out of Miss Forester, by Forester (398).

At the Worcester meeting of the Royal Agricultural Society in 1863, Spangle 2nd, in company with Diana 2nd, took the first prize of £15 for the best pair of Hereford heifers in milk or in calf. These were exhibited by the executors of Mr. Rea, of Monaghty; and at the dispersion of the herd which followed in the autumn, Spangle was sold to Mr. Baldwin, who, however, gave up his purchase to Mr. Rea, of Westonbury. This gentleman's premature death occurred soon afterwards; and at the Newcastle-upon-Tyne Royal meeting, in 1864,

Spangle 2nd, entered in the name of Mrs. Rea, took the first prize of £20 as the best Hereford cow, Kate the 2nd, from the same herd, taking the second place.

We thus spoke of Spangle, on first seeing her at Worcester: "The local prizes brought out but a short lot, chiefly noticeable for a pair of rare massive heifers shown by the executors of the late Mr. Rea, of Monaghty." And again at Newcastle: "A certain zest was given to the exhibition of Herefords by the entry of Mrs. Rea's two cows, a couple of grand animals, with size, breed, and quality, all in proof of their right place." At the Westonbury sale, in the October following, Mr. Baldwin, of Luddington, again became the purchaser of Spangle, at 101 gs., but she was unfortunately not in calf, and is now in the stalls preparing for the Christmas shows. They have still strong hopes, however, that she may breed, so that this grand cow may possibly again return to the herd after her visits to the Birmingham and Islington Halls.

## PLATE II.

### A JACK IN THE BOX.

From Waterford to London traces the birthright of our fish; and the O'Gorman thus writes of the Irish pike:—

"The small trout, the roach, the salmon-fry, a small herring, the tail of an eel spangled and tinselled, are excellent; so is a small jack, and sometimes a good-sized one; so is a goldfinch, a swallow, or yellow-hammer. My method of putting up a fry, or small trout, or roach, is to have a hook come out in the middle of its side, with a curve in the tail to spin. The head (when I was intent on real destruction) I fastened with another hook let slip down on the wire, or gimp, with a small loop well armed, and the latter hook came out through the back part of the head. I have often taken more pike, and even trout, with the upper hook than the lower; for fish of prey generally make at the head.

David Burke's method of catching pike was curious. He fished with a double hook, without a swivel, put his chain through the fish's mouth, and drew it out of the navel, tied the chain about the tail, and left the double hook projecting through the mouth of the trout, or fry, or frog. In this way the bait was dragged tail foremost; but he did not care, and laughed at any other method, and he always killed a great number of pike, and sometimes an odd salmon or so. He left the bait a very short time to any fish, and generally had him well hooked. This should seem an unnatural method, but it is a sure one.

"They are very whimsical fish, and the kind of bait must be frequently changed. I have often shot a pretty small bird for a bait, and killed large pike with it, when they would not look at trout

or roach. A good-sized pike-fly is often very good. The largest pike I ever killed was thirty-two pounds weight; he had a trout of four pounds entire in his maw, which he must have taken only just before he had made at a small roach which I had on a single brass wire; and it must have been from sheer wantonness, or sport, that he seized it; he was only three feet four inches in length, but as thick as a salmon."

Of the perch, the same pleasant authority speaks with as vigorous decision and indisputable experience: "They are a most bold, daring, and destructive fish, eat small fry of all kinds voraciously, root up the spawn beds, will even scare trout from the feeding places near the shore, like noise, and are fond of music, which attracts them to the surface. One of my sons (now I hope happy) assured me that he saw a vast shoal of them appear over water, attracted by the sound of the bagpipes, when a Scotch regiment were marching over a neighbouring bridge, and that they remained there until the sound died away in the distance. How much

superior the ear of the perch to that of Paganini! who, on hearing the Scotch pipe, prostrated himself on the floor, declaring that it must have been invented by the devil.

"Perch like their bait moving, and will take small fry, roaches, small trout, loaches, little frogs, and small eels, and will often rise at salmon flies and large lake flies; they will also take the large blue-head worm, and the leg of a frog put on a middle-sized hook; they are a most excellent fish—almost so good as to make amends for the mischief they do. And now for dressing them: Split for about three inches along the great fin, and as much in the belly; do not scrape, scale, or gut (it is a clean-gutted fish), broil well on a gridiron; when sufficiently done (which you will know by the skin rising well), take up; split the remainder of the belly, and the back; raise off the skin, which will come away easily; take off the head (to which the gut will attach, and come away clean); you then have a nice fish: eat it with cold butter, and, if you do not like it, you must be hard to please."

## OUR SUPPLY OF WATER.

BY CUTHBERT W. JOHNSON, F.R.S.

The purity of the water consumed by our live stock and by ourselves can hardly be too carefully regarded. That the water we use materially influences our health is a well-known fact. Cholera, typhoid, and other diseases, indeed, ever select for their earliest attacks the consumers of impure water, the dwellers around stagnant collections of liquid impurities. Our domestic animals suffer materially in this way—the horse is peculiarly sensitive and discriminating in the selection of his water: he avoids that containing animal matters; refuses even to drink from a pail that has held soap; the appearance of his coat is affected by using hard water. The groom, who is well aware of these facts, takes care to give his horses soft water. The trainer of race-horses sometimes carries the water with him to which they have been accustomed.

Thus regardless of the water for our horses, it would be reasonable to expect the same care in our own cases. But how very different is the ordinary mode of supplying ourselves! Think of the cesspools into which we drain our houses, in close proximity to, and their contents soaking into, our wells. Examine the waters with which many of our towns are supplied, and ask ourselves if these are such as we ought to consume?

It is, indeed, far too little known how widely varying is the composition of different spring, river, and well waters. It will not therefore be a profitless research if we inquire on this occasion into these matters.

We need hardly remind ourselves that the primary source of all waters is the rainfall. The rain descends upon the earth, not, as was once supposed, entirely pure, but nearly so; it is the purest of all the waters of which we have to inquire, it merely containing a minute proportion of ammonia, nitric acid, and other foreign substances. It is when that rainwater descends upon the earth, that, percolating our soils, it dissolves various soluble substances, and has its purity diminished.

In a very able work on "The supply of water to towns," well worthy of my readers' perusal, Mr. Baldwin Latham, the engineer to the Croydon Board of Health, has well traced the origin and course of rain-water. As he

observes, "Rain is the result of the condensation of aqueous vapour, which is, at all temperatures, more or less present in the atmosphere. The quantity of aqueous vapour capable of being suspended in the atmosphere increases in a greater ratio than the temperature; and the phenomenon of rain occurs when the air, saturated with moisture, loses its temperature, and precipitates the excess it is no longer capable of containing, either in the form of dew, rain, hail, or snow. It is found that the first causes of rain are identical with those that produce the winds and currents in the atmosphere, viz., the changes of temperature, to some extent the electrical state of the atmosphere, and the magnetic state of the earth; consequently it very naturally follows that the winds have a very close connexion with the rainfall. Thus, winds blowing from a warm climate over a great expanse of sea would be completely saturated with vapour, which, upon coming into a cooler climate, would be precipitated; on the other hand, a wind blowing from the frozen regions of the Arctic ocean, and deriving its moisture from the ice and snow of those severe regions, would, when it arrived in a warmer climate, by lowering the temperature of the atmosphere of that climate, diminish its power to retain aqueous vapours; and if, at the time, it was surcharged with moisture, a fall of rain must ensue. The physical conditions of every locality have some effect upon the rainfall. Thus, from observation, it has been ascertained that the rainfall is greater in mountainous districts than in level countries, which is probably owing to currents of air saturated with vapour striking against the mountain-sides, and losing temperature by contact or by reason of being compelled to ascend into higher and colder regions; there is, however, a limit to the effects produced by elevation, for there are regions too high to experience any heavy rainfall, for the rains of Switzerland and the Alpine regions are not greater than those in the north of this country. The amount of rainfall is considerably influenced by the position of the locality with respect to the currents in the atmosphere: for example, it is found that the prevailing winds in this country are



westerly, and come to us from a warmer climate: after sweeping over the face of the great Atlantic ocean they are naturally saturated with moisture, and, striking the ridges and high lands on our westerly coast, discharge the greater portion of their burden there. Thus we find it is nothing uncommon in the counties of Cumberland, Westmoreland, and Lancashire, to have an annual depth of rainfall equal to 6 feet; while in Cambridgeshire on the eastern side of the country, the annual rainfall seldom exceeds 22 inches. The rainfall also varies with the seasons of the year, the rainfall of this country being greater in winter than in summer, because the temperature of the atmosphere is decreasing in winter, and with it its capacity for retaining vapour, while in summer the opposite is the result. But it will also be found, as a rule, that heavier rains fall in summer than in winter, although there may be fewer showers; because in summer the atmosphere has greater powers for retaining moisture, so that when the causes that induce a fall of rain are brought into action, there is a larger amount of moisture to be precipitated. In Germany the rainfalls of winter and summer are about equal; at St. Petersburg the rainfall of winter is but little more than one-third the rainfall of summer; while in Siberia the rainfall in winter is but one-fourth that of summer."

In our island the average amount of the rain annually falling, varies from about 20 inches in Essex and in Bedfordshire to about 50 or 60 inches at Keswick and Kendal, or to more than 100 inches on some of the Westmoreland and Cumberland hills.

The next question is the varying extent to which the rain water is absorbed by our soils. Upon this branch of our inquiry Mr. Latham well remarks that "the amount of rain capable of being absorbed by the surface upon which it falls depends, in a great measure, upon the temperature, the geological formation and physical outline of the district. Under such varying conditions, the amount of water absorbed, and capable afterwards of being used, when issuing from springs, or by sinking wells, is extremely capricious. The greater the quantity of water evaporated or retained by vegetation, the less will remain to be absorbed. Rain descending upon a dry and parched surface in the heat of summer, or during the occurrence of drying winds, will be nearly all evaporated, so that the rate and amount of absorption depend materially upon the absorbent properties of the soil. Thus in the sands of the red sandstone formation the rainfall is absorbed as fast as it touches the surface, and the same may be said of the rain falling in many places on the chalk formation, while upon the clay soils or impervious formation the greatest part of the rain would generally be directly conveyed away by surface streams. The contour of a country, in a measure, affects the rate of absorption, as the rainfall on mountains or hilly districts has a greater tendency to gravitate rapidly to the rivers, while on table-lands the water lingers, and consequently such lands are favourable to absorption.

"Experiments made by Dr. Dalton, extending over three years on the new red sandstone formation, show that 25 per cent. of the whole rainfall percolated to a depth of 3 feet. Experiments made at Ferybridge, in Yorkshire, by Mr. Charnock, on the magnesian limestone formation, resulted in giving but 19.6 per cent. of rain percolating to a depth of 3 feet, and a like experiment made by Messrs. Dickenson and Evans, on the sandy gravelly loam which covers the chalk about Watford, gave as much as 30 per cent. of the rainfall percolating to a depth of 3 feet. In the latter experiment the average rainfall was found to be 26.33 in. per annum, and the average mean filtration 7.92 per annum. Of this quantity 7.84 in. were absorbed between October and March inclusive, which was at the rate of 55½ per cent. on the rainfall of that period, whilst

between April and September inclusive, only .58 in. of rainfall was absorbed, which was at the rate of 4½ per cent. of the rainfall of that period. From this experiment it appears that the largest amount of rainfall is absorbed during the months of November, December, and January, when practically all may be said to be absorbed, and that the least amount at any time absorbed was in the month of August, when practically it was nothing. It has been calculated by Mr. Beardmore, that of the rainfall absorbed in winter 60.7 per cent. is carried off directly at the time of the rainfall, leaving 39.3 per cent. to supply rivers and wells; and of this probably only 8½ per cent. of the rainfall absorbed really goes to furnish a supply for wells, which in a measure will account for the failing of many ordinary wells in certain seasons of the year. This process of absorption plays a very important part in the economy of nature, as by it the rainfall is stored for the purposes of utilization by both the vegetable and animal kingdoms. Were it not for this, our rivers would only flow in times of rainfall, and at such times their impetuosity and floods would be so great as to prove a great drawback to their subservance for the purposes of man, and at other times their channels would be dry, which would probably be a greater disadvantage, as all vegetation would suffer materially, if it could survive the droughts we should experience; as it is, the water falling on the surface penetrates it to various depths, forming for itself subterraneous reservoirs, and it is from these reservoirs the water is emitted which keeps our rivers flowing and supplies water for vegetation, even in the time of the greatest drought."

The different modes of obtaining a supply of the water which thus flows from the heavens is the next portion of this important inquiry. Here let us again refer to Mr. Latham's excellent work. He observes, p. 13, that "these are five in number, viz., 1. By the interception of the rain-water before it has reached the ground, as from roofs, &c. 2. By collections on the impervious surface of the ground before it has run off. 3. From streams. 4. From natural springs. 5. From wells." As to the first means of supply, he continues:

"One of the simplest modes of securing a supply of water is by collecting and storing the rainfall that falls direct upon the roofs of our houses, or upon the paved surfaces of yards, &c. This mode is no doubt very ancient, and was probably one of the first expedients adopted for securing a supply wherever man had advanced to such a state of civilisation as to require a house with an impervious covering for his shelter. The amount of surface available and suitable for receiving the rainfall is generally limited, so that the quantity of water capable of being stored is also limited; yet there are many places that depend upon this mode of procuring their principal supplies of water. A large portion of the supply of water for Jerusalem, Constantinople, and other ancient places, was procured by storing the rain-water in underground cisterns, some of which are in use to the present day. The city of Venice is an example of one of many places supplied principally by rain-water; but it is found that, in long dry seasons, the inhabitants of such places as are dependent on this mode of procuring a supply of water are often put to great straits for a supply; and if we assume that 60 feet of roof or impervious surface is available for each individual of the population, with an annual rainfall of 30 in. if all of it were collected and stored, it would only give two-and-a-half gallons per day as the quantity for each individual. Professor Leslie made a calculation with respect to a lofty house in Paris containing twenty-five persons, and he found that each person might procure a supply of a little over one gallon per day. When these quantities are compared with the twenty to fifty gallons per head per day at present used



by populations having a constant supply of water, it is easy to see the disadvantages of depending entirely upon the rainfall collected on roofs and other surfaces connected with our dwellings as the sole mode of supply."

Then as to the collection of water from gathering grounds, such as that which is carried off by the surface and other land-drains of our fields. This is a question peculiarly interesting to the readers of this magazine, since the collection and use of this water, as in irrigation for instance, is far from being generally understood. The amount capable of being collected in this way from a given surface of course varies with the nature of the soil and the amount of rain which it receives. "It," says Mr. Latham, "the surface of the drainage area is porous, resting on impervious strata, a much larger quantity can be obtained by under-drainage than if the water was taken from the surface only. The quantity of water capable of being taken by under-drainage, if the strata is uniform, will depend upon the depth of the drains. An experiment made by Mr. Milne, of Milne Garden, in Berwickshire, extending from June, 1848, to April, 1849, shows that under-drains, 3 feet deep, laid 15 feet apart, gave nearly 36,000 gallons per acre; while drains laid 3½ feet deep and 20 feet apart, gave at the rate of 47,000 gallons per acre, which was about one-tenth the rainfall of the district. It is clear from this experiment that a considerable portion of the rain descending on the surface either ran off at the time of the rainfall, and consequently did not penetrate to the depth of the drains, or it passed below them and out of reach of their action. In every porous soil a large portion of the rainfall could not be collected by drains placed a distance apart, as the water would penetrate deeper than the drains. From observations of some of the various works constructed for the supply of water from drainage areas, the amount of water taken and used varies from one-sixteenth to over two-thirds the rainfall of the district. There can be no doubt that if the surface of every drainage area was, or could be made, impervious, and sufficient slope be given to it to carry off the water quickly, a very large percentage of the rainfall might be used. But the great drawbacks to making the surface that should receive the rainfall impervious are—first, the expense; and, secondly, the restriction it would put on agricultural pursuits. The expense of making a surface impervious has been estimated by Mr. Hughes at £242 per acre, which price would exceed the value of the water that would be collected from it, so that if this system had to be put in operation at the present prices paid for water it would not pay. The sufficiency of the rainfall to furnish a supply of water may be derived from the fact that if two-thirds of the rainfall of England and Wales could be collected, it would furnish a supply to each individual of the population of a quantity exceeding 2,500 gallons per day; but the rain falling on the sites of our cities and towns would not be sufficient for a supply according to the present rate of consumption. For example, the most crowded parts of London are peopled at the rate of one person to every 12½ yards; now, taking this area with a rainfall of 24.8 in., if two-thirds of it could be collected, it would furnish 2.63 gallons per head per day. In the City of London one person has 40½ yards area, which with the same rainfall and at the same rate would furnish 8.54 gallons per head per day."

The water which flows from field drains or collecting grounds is far from being pure. It contains small portions of the soluble matter contained in the soil from which it flows. Some specimens of the water from the drains of various cultivated soils were some time since examined by Professor Way (*Jour. Roy. Ag. Soc.*, vol. xvii., p. 123). The following were the foreign matters (given in grains) contained in an imperial gallon of two (previously

filtered) drain waters, from two fields on the farm of Mr. Paine, at Farnham, in Surrey:

Silica	...	0.95	...	0.41
Phosphoric acid	...	trace	...	0.12
Sulphuric acid	...	1.65	...	5.15
Chlorine	...	0.70	...	1.10
Lime	...	4.85	...	7.19
Magnesia	...	0.68	...	2.82
Peroxide of iron	...	—	...	—
Ditto and alumina	...	0.40	...	0.05
Potash	...	trace	...	trace
Soda	...	1.0	...	2.17

Then as to the soluble organic matter, ammonia, and nitric acid, found in land-drainage waters, in seven different specimens, from the lands of Mr. Paine, there were obtained (grains in imperial gallon)—

	Soluble organic matter.	Nitric acid.	Ammonia.
1	7.0	7.17	0.018
2	7.40	14.74	0.018
3	12.50	12.72	0.018
4	5.60	1.95	0.012
5	5.70	3.45	0.018
6	5.80	8.05	0.018
7	7.40	11.45	0.006

The ammonia and nitric acid contained in the rain water which supplies this drainage water varies considerably in different months. That falling at Rothamsted, in Hertfordshire, 20 miles from London, has been examined by Professor Way (*ibid.*, vol. xvii., p. 143). He found (grains) in an imperial gallon in—

	Ammonia.	Acid.
January	0.092	0.017
February	0.104	0.042
March	0.086	0.021
April	0.123	0.035
May	0.080	0.035
June	0.135	0.080
July	0.061	0.017
August	0.080	0.060
September	0.095	0.021
October	0.061	0.036
November	0.054	0.018
December	0.067	0.017

Of river water I need hardly remark that its quality varies with the nature of the country in which its springs arise, and through which they flow. Thus the water of the Clyde contains in an imperial gallon about 9 grains of foreign matter; that of other of our rivers as follows:

The Severn	... about 4 grains.
The Thames	... 23 "
The Ouse at Ely	... 32 "
The Lea	... 24 "
The Colne	... 21 "
The Trent	... 50 "
The Dee	... 4 "
The Don	... 9 "

The most general mode of supplying our farm houses with water is from wells. The use of this kind of water in irrigation is common in oriental countries where a large amount of water is thus procured by either manual labour or other very simple and laborious modes. That the use for irrigation of the water obtainable from wells might be very beneficially extended in suitable situations I have no reason to doubt. The amount of water thus obtainable is much larger than is generally understood. There are two wells at Croydon, each of which supplies 1,000,000 gallons per day to that town; and it is from these, where the water drains from the town as sewerage, that the 250 acres of land at Beddington are so well irrigated. From other wells still larger supplies of water are obtained. The reader must remember that the water of the great wells, such as that of Croydon, all contain various saline and earthy substances. Mr. Latham has in the following

table given the results of the analysis of a gallon of five of these well-waters :

	LONDON shallow wells.	Est. up- per part of city.	BURTON on TRENT.	CHOR- DON.	DRAIN- TERR.
Carbonate of lime .....	30.50	25.10	15.51	15.41	2.40
Carbonate of magnesia.....	—	—	1.70	.81	11.30
Sulphate of lime .....	8.20	18.38	18.96	.63	—
Sulphate of magnesia.....	—	—	9.95	—	.70
Chloride of magnesia.....	—	.18	—	—	—
Chloride of sodium.....	12.30	10.88	10.12	1.61	44.00
Alkaline sulphates .....	14.70	16.97	7.65	1.03	—
Alkaline nitrates .....	16.70	28.88	—	—	12.80
Iron alumina.....	1.10	.71	.60	—	traces
Silica .....	—	.14	.79	.93	1.30
Organic matters .....	—	.68	—	1.09	—
Total.....	83.50	101.90	65.28	21.11	72.50

The result then of the examinations of the water with which our lands are supplied, is full of interest and instruction. It is so, whether we regard that water as

merely for the use of our houses and homesteads, or as applicable for the irrigation of our grass lands. The grains of saline or organic matters per gallon which the water we employ contains we have noted to vary considerably in amount; and that variation there is no reason to doubt produces a material effect upon the health of the consumer. Neither must we omit to remark that the value of the soluble matter carried off from our soils by the drainage water is far more considerable than is commonly known. We can easily make an approximate calculation of the amount thus removed from our fields. If we take the rainfall at only 25 inches, that upon an acre of land is equal to 567,168 gallons, or about 2,532 tons a-year. Now about two-fifths of this quantity soaks or drains away, and about three-fifths evaporates, so that only one grain of any substance in a gallon of water amounts on the whole annual drainage of an acre of land to about 240,000 grains, or more than 34lbs. And this amount in those counties where the fall of rain is so much more considerable is proportionately increased.

## THE HERDS OF GREAT BRITAIN.

### CHAPTER XLVII.

#### THE SHOLEBROKE HERD.

'Twas June, when insects flushed with sun  
Make horses kick and heifers run,

and a smart eight-mile ride we had of it behind two blood greys, one of them bred by the late Sir Tatton, from Blisworth Station to Sholebroke. Blisworth Gorse lay to our right, and a line of trees marked the boundary of "Tiffeld Poor Allotments," which the Grafton pack know well. Lord Pomfret's house closes up a stately avenue of elms in the park, which is next year to be the scene of the Northamptonshire Agricultural Society; and another half-mile brought us to Towcester, on whose walls not a few quarters of good Midland wheat had just been transmuted into political paste. The time for another great county grapple was drawing nigh, and the Pomfret Arms and Talbot Hotel had broken out respectively into quite a Knightley blue and Grafton scarlet rash. Still, amid all this excitement, a few of the quieter spirits had time to think of more earthy matters, such as the building of a corn exchange, which Towcester needs right sorely.

Sholebroke lies about three miles from the town on the road to Buckingham, across the Royal forest of Whittlebury. The ring of the mattock and the axe has been heard in that forest for many a long year from Stoney Stratford to Astwell, and Porter's Wood no longer stands to mark its northern edge. On the uplands to the right, which gradually die off into Mr. Drake's country, and marked more especially by a tall tree clump, is Foscoate, where "Old Val" Barford lived for many a year, a breathing pastoral in himself, and firm to the last in his boast that his Bakewells were as much alike as his bees. The ghosts of the long arguments with which he used to enforce his infallibility, must still go sighing round those elms, like thin voices of the night, over the meagre result of the sale which sent the greater part of the flock to Cambridge-shire. Another mile, and we turned off sharp across a few fields, and there, lying snugly at the end of a small sloping glade, in which the fox cubs come out to play from the forest remnants on each side, is the white outline of Sholebroke Lodge, among its dainty purple beeches and rose trees. It was once the Deputy Ranger's Lodge,

and troops of red and fallow deer still roam among the oaks of their old Whittlebury Park domain within a bowshot of its windows.

Captain Oliver came here for the sake of the hunting in 1855, and took 400 acres, a hundred of which is arable, along with the Lodge, from Lord Southampton. The land is a strong clay, and grows wheat, oats, and beans well. Mangels prosper fairly, but turnips have been a failure, and the land is too wet to feed them off with sheep. So far the Captain has cast in his lot with Shrops, and used tups of Freeford, Holland, and Bradburn blood. He lambs about 130 ewes each year, and sells off the wedder hogs, and gimmer culls after shearing. Up to 1860 he was content with the common Shorthorn of the country, and then nothing short of pure blood would satisfy him. No man has bought more carefully or yet more dashingly at sales, and at present his herd numbers some sixty head. He is fond of a little rosette practice, but he seldom wanders farther afield than the Royal, the Northamptonshire, the Buckinghamshire, and occasionally the Yorkshire shows, and puts nothing under high pressure after it is eighteen months old. So far he has only visited the Royal twice, but he has never returned without cash or card. Lalage 2nd was second to Mr. M'Intosh's Lady Oxford 5th in the heifer calf class at Worcester, while Roving Butterfly was commended among the bull calves, and again when he went to Newcastle.

Orange Blossom, from Mr. Crawley's sale in '60, was the first entry in his "Herd Book" peerage. Then the Mileote sale furnished three more—Old Queen Anne by Baron Warlabby; Festoon, of the Fringe tribe, by Kirk-leavington 4th, and Sincerity, of "the Charmer sort," as shorthorn men always phrase it. As yet, the Captain had not taken the oath of allegiance to any "sort," and that summer found him at the Ring-side, when Mr. Dudding's century made their fifty all round. From Pantom he returned with three heifers—Rose of Cambridge by Superior, Autumn Rose by Vanguard dam by Baron Warlabby, and Anna by Vanguard. After that he looked out for Bates, and has made it his general rule to have it with an occasional dash of Booth to get more solidity. The general tendency of his breeding corresponds with our

old friend Easton's "Field and Fern" definition of Mr. Barclay's line of action at Keavil: "*We've mostly Bates, with a mixture of Booth for emergencies.*" The journey to Mr. Peel's sale at Lancaster was one of good omen. It was there that he first took his show-yard cue, by buying not only Lalage by Prince Imperial (18443) the dam of Lalage 2nd, but Cowslip, the dam of Malachite, with her six weeks' calf Campanula, which was the second yearling, in a large class, to Lady Pigot's Rose-dale at Stamford; and headed her class at Buckingham. Lalage was not easily bought, as Mr. Young from Keir was in the vein, and Captain Oliver had as smart a finish with him as he ever had with "The Squire," Mr. Percy Williams, Captain Pettat, and all the other silken heroes of his Croxton Park and Gorbamby days. However, at 230 gs., Mr. Young would have no more of it, and the Captain's "*and five*" decided it. He had to yield in turn four years after, when Mr. Barclay and Easton came all the way from Dunfermline to Lawford, to look after Seraphina 13th. But the latter shall give us this episode in his own words once more, as he told it to us when we were quartering Scotland like a pointer dog, for book lore: "*Come awa' my Seraphine 13th.* I met Captain Oliver lately, and he asked very kindly after her. He was our opponent at Lawford. He's not easily beaten off. I said to Mr. Barclay, 'Go in and give him another choker—it's as well to do right as wrong.' So we got her for 250 gs. She will be just three years and nine months, and she's had two calves, and in-calf again \* \* \*" and so on.

Up to this point the Captain had not required a bull, but late in the January of '61, he turned his face Towneley-wards on this very difficult errand. Culshaw gave him the choice of five, and he finally fixed on one of the twins, Romulus Butterfly by Butterfly's Nephew from Pageant, at 250 gs., and never repented his visit. Mr. Surtees's sale at Dane End furnished Baroness and her two daughters, Viscountess and Rose of Dane End, at an average of 63 gs. each; and then he once more set off North in search of a bull for these three, and to cross in future years with the Romulus Butterfly heifers. Mr. Atherton's sale was his destination, and Seventh Grand Duke his destiny. The Seventh was then a six months' calf, and as Mr. Robinson was equally hot on him, he and the Captain stood right and left of Mr. Strafford, and made their deliveries. They were no

"Simple pair, who simply sought renown,  
By holding out to tire each other down,"

as the roan was something to be in earnest over. However, the Captain not only stayed longer than "Clifton Pastures" up to 820 gs., but took the four months Cherry Duchess 9th (140 gs.) as well, to fill up the North Western horse box.

Crinoline by Highborn (18029), a roan of great size and substance, with her head quite a study, was a purchase from Mr. Longland of Grendon, who brought the Duke of Devonshire's Lord of Oxford at upwards of 200 gs. into the county. She and Sonora were both dropping to calve, and it was a very fine point whether they would hold up long enough to get within the Royal limits. The 28th of June came and went, and so did the 29th, and each morning the spirit moved us to awake in the grey twilight, and peer into the glade from our lattice, to see if Crinoline was uneasy. On each of these mornings she "roamed mid the dew," and while Sonora "broke down on us," another Eastonian phrase, with a red heifer calf, eleven hours before July came in, Crinoline held happily on with a roan bull calf to the 2nd. Both of the youngsters were by Seventh Grand Duke. Three roans, for whom "The Seventh" and Romulus Butterfly were supposed to have lived and loved in vain, were spending their last summer-days in

the Stripe. One of them was Baroness, a fine old ruin with a down-curved horn; Barmaid, bought from Ellis Clark, now Mr. Roberts's bailiff, was a great milker in her day; and Autumn Rose made up the trio. Another two months' trial has induced a belief that they have all turned over a new leaf.

From this Penitence Pasture, we passed to the Far Field, where the jilts are freshened up again after being put on short commons. Orange Blossom by Tambour (18366) and her daughter Orange Bud by Romulus Butterfly were both there, the former a very good-looking cow, and it was a thousand pities to find another like Rose of Dane-end under a cloud. From here we went back to the farm-buildings, part of which were the "old original" Grafton kennel. The cows were in a sort of covered barn, reminding us of the "Clifton bins," and furnished with stalls along one side, and those good old-fashioned wooden neck-stocks which fasten each cow in an instant, and save chains. "Malachite's dam for a thousand" would rise to any one's lips, if they had ever seen the bull, and, save in the dams of Forth and the Hereford Sir Richard, we have seldom seen such a likeness between dam and offspring. This Cowslip 5th by Chieftain (10048), from Cowslip 2nd by Duke of Norfolk (5952), is no belle of the steading, but she has been a serviceable one both to Mr. Ambler and Mr. Peel, as well as the Captain, during her 14 years. Her birthday record must have been lost, as she heads the catalogue simply as a "roan of 1851." The neck is a peculiar feature in her, and she is a rare milker. One calf by Duke of Geneva died since she came to Sholebrooke; but the tribe has prospered in females, as her Campanula by Valasco and Crystallina by Grand Duke 7th are both in the herd, and so is her granddaughter Campanella by the same bull from Campanula. Near her was the perverse Anna by Vanguard, dam Adora by Belvedere 4th, the breeder of three white bull calves, and then of a roan in succession. The neighbourhood profits therefrom, but it is to the Cherry Duchess and Lalage lines that Captain Oliver looks for his bulls. The white Festoon had put out one roan blossom in Filigree by "Duke," and another Adkins (which never leaves her side), Sincerity of the Charmer sort, with fine depth of flank, and a shoulder which old Sir Charles would have paused over in his day, had fused with Romulus Butterfly in Sonora, on whom the bull had put his own gay head. Then came the lengthy red Lalage with her fine speaking eye, and the dam of three heifers. Her Lalage 3rd died; but Lalage 2nd was there, relieved from all show toils, and with that sweet arm and deep breast which set off the good form and flesh points, that carried the second honours for her at "the faithful city." Orange Fruit by Booth's First Fruits was a useful cow, and had made up the quartet of Oranges with her Orange Flower. Romulus Butterfly and the deep-bodied Autumn Rose by Vanguard, from Admiration by Baron Warlaby, had hit nicely in Adela; but she was out of sorts that day. Willy Witch, with a deal of Mr. Wetherell's blood in her, was there to tell of Bushey; and Cherry Duchess—with her fine eye, back, and quality—of the July day at Speke. She has been a lively breeder, and at three years and four months we found her the dam of Cherry Grand Duchess, and Cherry Grand Duke by her railway partner of that day.

Some side-bins were then opened, and out came the prize-fighters of the hour—the white Campanella, and Creole by Hayman (son of Highborn) from Crinoline by Highborn. In-breeding had not affected her rich deep flesh, but there was a chubbiness about her forehead which pulls off a point or two for elegance when she is drawn up with the bigger Campanella. The Captain had therefore duly declared to win with the latter in the Northamptonshire Show, and did it cleverly enough. There were two pro-

misgiving ones of the younger generation, roan and white—Crystallina and Lalage 4th, both of them by Seventh Grand Duke. A close kinsman, King Christmas, the first from "the Worcester calf," was in the boxes outside, with his half-brother King Bomba, who was out of form, but still nice in his touch. Little Cherry Grand Duke was near them, with only six weeks, and a wedge-like white blaze on his head, and the blood of four Grand Dukes—First, Second, Third, and Seventh—in his veins.

From him we journeyed past the hayfield and the remnants of the kennel to which the Grafton hounds adjourned from Sholebroke. The farm-bailiff lives in Tom Rose's and George Carter's old house, and the groom and garedener in the first and second whips'. A troop of white dorkings were in possession of the boiling-house, and the kennel-yard was partitioned off for bull-boxes. Tom Ross and George Carter were men of very different styles. The former loved his "wild boys" to the close, and gave as his reason that "nine out of ten days I am in a wood, and those are the sort that will have him. What you call a good pack will never catch a bad fox, and as I want to hunt *him*, instead of his hunting *me*, my hounds are the ones for the country!" George Carter, on the other hand, fought hard to make them steady, and, in the words of Sir Charles Knightley, he "was the first man in that country who could ever catch a good one over the open." But three-and-twenty seasons have rolled over since the hounds were seen in that paddock, and Cherry Grand Duchess, a very thick-fleshed, good-looking red, like the

Lalage lot, and her half-sister Adelina browse there now. So on we went to the bull house, and into the lion-headed presence of Romulus Butterfly, a fine grey roan, with a beautiful touch, and a remarkably good coat. Legs, loin, and head were all grand points in Seventh Grand Duke, who carries out the fine level promise of his calf-hood, and has never been made up in his life. Half-a-mile more and we are riding past the fox-proof fence, which runs round the flower gardens of Whittlebury, from whose blackened ruins Lord Southampton's new house is beginning to rise. Grafton kennels about here are as thick as deserted gipsy encampments in the Cambridgeshire lanes; and we found the third at the edge of the Forest, from which, when Lord Southampton gave up the mastership in '61, the hounds moved on to Wakefield Lawn. Stowe Obelisk is just visible in the distance. The direction of Wicken Park is indicated to us, and we learn that the grand old Marmaduke and Duke of Geneva are about to arrive there, on a visit from Penrhyn—the latter with an eye to the Northamptonshire bull championship which he won. The name of Roberts and Lillingstone Dayrell bring back Lady Barrington, Diadem 4th, Roan Duchess by Mayduke, and many another good fight amongst Mr. Strafford's waggoners; and we meet some sturdy specimens of Lord Southampton's waggon horses, all blue roans and a dozen strong, as we head back to Sholebroke for the night.

H. H. D.

## THE NEW PART OF THE ROYAL AGRICULTURAL SOCIETY'S JOURNAL. THE CATTLE PLAGUE.

The summary of contents to the new Part of the Royal Agricultural Society's *Journal*, as now just published, is very suggestive of the spirit of the age in which we live. Practice with Science would appear to have fairly tired of trying to grow corn at our present prices and prospects, and accordingly all the leading papers turn on the care and cultivation of stock. The opening article is a prize essay on the management of sheep by Mr. Coleman, and the second an inquiry into the reproductive powers of domesticated animals by Professor Tanner. Then, Mr. Reynolds, a veterinary surgeon, writes on a new form of disease amongst lambs; while Mr. Dixon gives us a history of the Shorthorn, and Mr. Evershed comes in again with something more upon sheep. The comparative profit from making cheese or butter, selling milk, or grazing, is the subject for a comprehensive treatise provided by the Society, and written up to by Mr. Heywood, well-supported as this essay is by another from Mr. Carrington on Dairy Farming. Mr. Herbert, as usual, supplies us with the statistics of live stock, of dead meat, and of wool, and Mr. Clayden writes briefly of the advantages of lucerne as fodder for animals on the farm. Thus, of eleven leading articles, as it were, Mr. Clatterback and Professor Voelcker are only allowed to trespass on the more popular questions of the day, the former with a rather dry treatise on water-supply, and the Society's chemist with some observations on the functions of soda-salts in agriculture. Amongst the head-and-tail pieces there are also Mr. Dent's well-digested report on the exhibition of live stock at Plymouth, an address by Mr. Ellman on the breeding and management of sheep, and another by Doctor Budd on typhoid fever in pigs. On such a showing there is little doubt but that many a member will cut into his copy of the *Journal*

with more anxiety than usual, and yet we question whether he will not be more than ever disappointed. This is the concluding Part for the year 1866—a time memorable in the annals of Agriculture for the sensation created by the outbreak of the Cattle Plague. And yet the future historian will turn and search in vain through the pages of the Royal Society's *Journal* of this same year for a single sentence referring to the disease, its ravages, or the preventive measures adopted. The Editor has not a word to say on so momentous a subject, the College has clearly had no time to make any communication, and the Veterinary Committee, curiously enough, do not ask for a few pages wherein to reprint the address they have so recently been circulating in the form of a letter. It is true there was not much new matter in this, but the paper was carefully drawn, and included so many authoritative suggestions and directions as to render the *Journal* the place of all others for its embodiment, mainly of course by way of a reference for hereafter. A man binds his books and burns his letters; and if the address of the Veterinary Committee was worth issuing, it was certainly worth preserving in some more substantial form. So far as we have yet had any opportunity of studying the Michaelmas part, we only gather from Mr. Herbert's article, which is given without any date, that "fortunately very few losses have been sustained by disease in any of our leading grazing districts; but we understand that just at the end of June a kind of gastric fever broke out amongst the cows and heifers in various parts of the country, which, unless speedily checked, is likely to lessen our supplies materially." Surely, considering the time that the sheets of the *Journal* are passing through the press, we might, in the

way of an occasional foot-note or otherwise, have heard something a little more definite as to this kind of gastric fever, even if the Editor were too much engaged to give any summary of all that had occurred so far, or the Veterinarians to send in their rules and regulations for the due observance of symptoms or the adoption of preventive measures.

This reticence is the more remarkable in such a quarter, as there is scarcely a paper or a periodical but which has had something to say on the subject. This something, we are quite ready to admit, has not been always offered on the highest showing; but one of the first means for our safety must be in directing men's minds to the matter, and where should we look with more reliance than to the pages of the national Society's own organ? Anybody may write to *The Times* or *The Mark Lane Express*; while a communication inserted under the auspices of the Hanover Square Council would of course carry every possible weight and authority with it. But the probability is that we shall have to wait for another half-year, or until the disease has died or been starved out, before we get any further advice from head-quarters. In the interim we must be content with what we can glean from the papers, and certainly our powerful contemporary in Printing-house Square evinces every disposition to give everyone a hearing. Indeed, in *The Times* of last Thursday there are two letters following on in the same column, that come in amusing comment one on the other. In the first place Mr. Edmund Tattersall, of the well-known Hyde Park firm, is allowed to express his belief that the disease is the rinderpest, as that he believes "nothing of the spontaneous nonsense theory." To be sure, he offers no proof of either one or the other, as no one has yet been able to trace the introduction of the evil from abroad, whilst there are many causes existing amongst us that might have tended to generate such a plague. However, Mr. Tattersall has met with an officer in the Austrian service who spoke confidently of the disease being rinderpest, as that it would kill a great proportion of the cattle in England. And this is the remedy: "He told me that when it had made its appearance in Austria, as soon as it broke out in a particular district, a line was drawn around the parish, varying in circumference, and every head of cattle killed, whether attacked or not, and no cattle allowed to go on to the infected ground for a given period. Experience had proved that it was the only effectual means of stopping this dreadful disease, which he had known to destroy immense herds. I inquired who compensated the owners of the cattle, and he said the Government!" Whereupon J. R. H., writing from the Union Club, tells how "a farmer in Suffolk had the disease among some of his cattle, but had also quite separated from them, and shut up in a separate shed, with the door almost constantly closed, a perfectly healthy fat heifer, which he did not show to the inspector, but sent to market when ready. It appears to be distinctly admitted that there had been no contact between this animal and the diseased ones, but it was supposed that some diseased animals had been driven past the door of the shed it was confined in. For this, which the magistrate construed into 'contact,' the farmer was fined £10 and costs." And further, "To show the ignorance of the inspector, I refer to your columns, where it appears that the only two cows out of a herd of thirty that were saved had been condemned by this very official, but as they were in a part of the field out of his jurisdiction the farmer refused to kill them." Mr. Tattersall, speaking as a consumer, says, "Take the bull by the horns, and kill everything;" while J. R. H., who does not pretend to be disinterested in the matter, but owns to being a large landed proprietor and to having over 120 herd of cattle, maintains that "the present sys-

tem of indiscriminate slaughtering, though it may greatly raise the price of meat, will never effect what we want—a cure." For our own part, and as in some way reconciling these contradictory opinions, we are inclined to think that the precautionary means already adopted under the active agency of the Government have done much to stay the spread of the disease, and that it may be eventually subdued without proceeding to such extreme steps as those which Mr. Tattersall and his Austrian friend advise; even admitting that the plague is of foreign introduction. In some districts we know that a kind of panic has come from the very slightest cause, and though cattle have been kept back from many of the autumn shows, this has been done almost invariably as an extra precaution, and not from any "case" being really known of in the neighbourhood of the meeting. In referring last week to the abandonment of the Hereford Show for this year, we concluded that the great Hereford Fair would also stand over; but Mr. Duckham now writes to say "it will most assuredly take place unless some visitation of which we are not at present aware should befall this county. Thank God, the stock of the county was never in a more healthy state than at the present moment, as far as I know; and even if otherwise, I feel I should not be long before being made acquainted with it."

We subjoin some very sensible remarks from *The Times*, as to the commonly-accepted theory of the plague having been brought from abroad, when the Veterinarians cannot as yet offer an atom of proof to that effect:—

If the plague is epidemic, it will travel in spite of the most complete isolation of diseased cattle, nor could we stop it by the instantaneous slaughter of every infected herd. This theory would enable us to attempt a cure, and to resort to remedial measures, instead of endeavouring to extirpate the pestilence by the wholesale massacre of sufferers. Upon these principles, if they could be approved, our whole policy might be modified. We should look for the causes of mischief: home rather than abroad, and should think more of our own cowsheds than the conditions of pasturage in Russia.

The other theory is one which in former times was applied to all plagues whatever, but which in all cases, except this new case of a cattle plague, has been deliberately exploded. What is said now of the Russian "*rinderpest*" was said in as many words of the Egyptian plague. That plague used to visit us periodically, and was invariably ascribed to a shipload of infected substances; yet we never get the plague imported now. We are told that a century ago this very cattle disease came to us from the same source. That it should be traced to foreign importation then was perfectly natural, for nobody believed in any other origin of plagues; and it is precisely because the doctrine is still calculated to commend itself to our prejudices that we should begin by putting ourselves on our guard against the temptation. It is so conformable with our old notions of pestilence to believe that the disease is none of our own, that we should be suspicious of so plausible a theory. So many matters are settled, so many questions put at rest, and so many obligations dispensed with, by looking at this plague as a spark thrown among us, to be stamped out with the foot, that such a view of the case should be very narrowly examined. A really philosophical inquirer would think the chief burden of proof thrown upon those who declare the cattle plague to be a purely Russian disorder brought hither by Russian beasts.

Let it be conceded at once, for it does not seem to be anywhere questioned, that the disease now among us is identical with the disease well known in Russian pastures, and there termed the "*rinderpest*"—the next step is to prove that the *rinderpest* could arise nowhere but in Russia. It has been observed that the conditions of animal life on the Eastern steppes must needs be peculiar, and likely, therefore, to generate a peculiar disease. Possibly; but then we know that this disease in itself, so far from being peculiar, is the very commonest, most universal, and most easily produced of all the diseases known to man. It is nothing whatever, notwithstanding its outlandish name, but typhus fever—the name indeed by which the French actually call it. We know far-

ther, too, that if the susceptibilities of cattle resemble those of men, the conditions of life in metropolitan cowsheds are far more naturally calculated to generate typhus than any state of things which could exist upon open steppes. Doubtless the fact remains, and is not without its weight, that our cattle did not get typhus fever till now, however ill they might have been housed; but then it should be remembered that British cattle of 1865 are not exactly the British cattle of former years. We have imported very largely, and mixed our stocks, and we have been rearing and feeding our beasts on entirely new systems. Then, the season has been a most exceptional one, and for months together we have had the burning heat of more southern climes. Again, however, it is to be stated that just when this plague did break out, cattle did come in from Russia; but, again, it must be asked in reply, Did not cattle

ever come in from Russia before? We know perfectly well that within the last few years murrains just as fatal and destructive as our own have ravaged all manner of lands, especially Egypt. Was it really from Russia that the cattle plague got to the Nile? If there was nothing in the air, but everything in contagion, is it not remarkable that a Cattle Plague should have travelled about the shores of the Mediterranean, just as another plague, not traceable to Russia, is doing now? Is it not curious that the disease should appear here and there on the continent of Europe, and go away again as mysteriously as it came? Is it not strange that in our own country at this moment we should have cases of infection, like that of Lord Sydney's cattle for instance, which not even the most overstrained theory of contagion could possibly explain?

## THE BUCKS AGRICULTURAL ASSOCIATION.

### MEETING AT AYLESBURY.

This Society carries a more lengthy title than it would be convenient to place in a head-line, having been known for the last seven years as "The Royal Bucks Agricultural Association and Central Bucks United." Union in this instance, no doubt, has been strength; for, strange as it may sound, the uses of the annual meeting were for some seasons fairly frittered away by two shows held at the same place, and embracing precisely the same district. There was the old original Royal Bucks, so long identified with the late Duke of Buckingham, more especially during the time he represented the county as Marquis of Chandos; and the new Central Bucks, which traced its establishment mainly to the advancing interest of the Rothschild family. Considering that these rival houses agreed, at any rate, in making Aylesbury their head-quarters, the absurdity of such autogonism soon became apparent, and an amalgamation of forces was necessarily brought about. This centralization, however, is by no means so complete as it should be, for the Royal Bucks or the Central Bucks means, after all, but little more than the Hundreds of Aylesbury, and the gathering altogether scarcely assumes to anything higher than a certain local influence. This is easily accounted for, as there is another Buckinghamshire Show to be celebrated at Buckingham next week; and thus, while the neighbouring counties of Bedford and Northampton have brought all their tributaries to one fountain-head, Buckinghamshire like Oxfordshire encourages a succession of minor meetings that hardly rise beyond the character of parish ploughing-matches. There is a narrow-mindedness about this hole-and-corner business that cannot be too soon corrected, although we are fain to admit that we have been anticipated in much we were prepared to say as the result of our visit on Wednesday, by the President of the occasion. If the exhibition itself be of no great moment, there is always something of a treat in hearing a finished orator like Mr. Disraeli address his constituents; and it was amusing to see some of these driving up just too late for the show, but just in time for the dinner. It is only to be regretted that this should continue to be held in the narrow room at "The George," as surely there should be some public building better fitted to the purpose, however well such accommodation may have answered five-and-twenty years since. As we have intimated, Mr. Disraeli was in the chair, and no one certainly could have performed the duties of such an office more efficiently. Avoiding, as is now his wont at these meetings, any political manifesto, he touched lightly on the harvest and the elections, traced the cattle plague back to the days of Virgil and the Georgics, and then earnestly addressed himself to advanc-

ing the fortunes of the Association whose business he had been called upon to conduct, in a speech that should give it a far higher standing amongst such institutions: "If I look technically over our usual authorised catalogue, and compare it with those which have been published for the last three, four, or five years—even from the time when the junction took place between the two societies, and which it was supposed would give increased energy and greater exertion to the county—I cannot see that there is any material feature to call your attention to. The aggregate entries of the last five or six years are not reduced, the number of exhibitors is not diminished, the amount of money given in prizes is not decreased, and one might make a very plausible, popular appeal upon each, and come to the conclusion that, if not progressive, we are at least conservative in our position. But when I analyze this catalogue, I find some results and circumstances which, to me at least, are not satisfactory. If I look to the number of contributors to the exhibition, I find that nine-tenths of them are furnished by the county of Buckingham. That does not look as if there was any great competition with other counties; but what is more, these nine-tenths of the county of Buckingham consist of dwellers within a particular district of the county. That has a tendency as little as in the former institution to competition, which is supposed to be the mother of excellence. That is one feature well deserving of attention. There is another which I do not like. I do not see that the landed proprietors of the county are included in the increase, in the manner which we have a right to expect. Indeed, with the exception of one who is absent—the squire of Aston Clinton (Sir Anthony de Rothschild)—whose boundless liberality and good-natured energy have exhibited themselves on these occasions with so much effect, I scarcely find any individual of that order doing what I conceive to be his duty to the county of Buckingham under these circumstances. And what is the cause of this? I cannot believe that the landed-proprietors are deficient in a sense of duty; I know they are the reverse. I cannot believe that amongst the tenant-occupiers of Buckinghamshire there is any want of emulation; I know from personal experience that the contrary is the fact. There must be some reason for the present state of things. Why is the state of Buckinghamshire different from that of the county of Northampton, or any other county? We have here a county association. It is invested with the halo of Royal patronage. It meets, and you know the consequences of its meetings. They are different from those which occur in contiguous counties. A gentleman has recently given me a description of the show in the county

of Northampton which may be interesting. Now, there is nothing in the county of Northampton which should give it an advantage over the county of Buckingham. But the Agricultural Association of the county of Northampton met the other day in the city of Peterborough, and I have been told by more than one gentleman that there was an exhibition of stock like that of the Royal Society in miniature, and hardly in miniature. There were contributions from men in distant counties competing for prizes; there were hundreds of pounds taken in the show-yard from those who were anxious to view the exhibition. The first gentry of the county of Northampton were present, and there were troops of tenant farmers not only from every part of Northamptonshire, but from the bordering districts, full of animation, of the spirit of rivalry, and of the creative spirit of competition; and such were the numbers and such was the excitement and interest created, that the show was kept open for two days. I want to know why these things do not happen in the county of Buckingham. Gentlemen, I want to put the question before you in a business-like point of view. It is not always viewed in that way, and can only be viewed properly through the medium of an enlarged and considerable experience. Now, what was the consequence of the great change in the laws which regulated agriculture some years ago? We are not here now to question the propriety of those changes which we have witnessed, and which have been the subject of controversy; but we have a right, and it is our duty, to ascertain the results of that change, and I say that the results of that change are no doubt these: That the owner or the occupier of the land can no longer count upon the price of wheat as the principal source of his revenue or his profit. Well, though you are placed in a different position, you have less cause to complain than most men have, for a bountiful Providence has favoured the county of Buckingham in possessing the finest pastures in the country. You mainly depend upon your herds or flocks; but when you form societies like the present, the principle of which—to use the language of your constitution, and better language was never before employed—is, though I may not quote it correctly—but I give the spirit of it—to promote the cultivation and improvement of agriculture and husbandry, to improve stock, to encourage and foster all experiments that may tend to the advantage of the soil, to offer premiums for the emulation of all classes, and for the improvement of all implements in agriculture; I ask, what does that language mean? It means this, that the society is formed really to maintain and increase the sources of your wealth. You must consider in forming these societies whether you attain objects by which your wealth is to be maintained and increased. Gentlemen, I must say that I do not think the present system is one which will effect the object. The reason is that the position we have taken is by far too local. Now, I should be the last person to speak with any depreciation of the local sentiment; for the local feeling is the deepest and most precious, as well as the most captivating and enduring influence that can govern men. But for all things there is a season. The hedger, the Thatcher, the dairymaid, the ploughman, the cottager, who is encouraged to practise habits of cleanliness by rewards—these are parties who can very fairly be brought under the influence of a local institution. But when you come to the exhibition of stock—stock which is to be the source of your worldly prosperity—what you want is excellence, and you can only obtain that excellence by competition. Therefore, I describe your position as somewhat unsatisfactory; for really you have been attempting to do two things at the same time which are perfectly incompatible—to reward local merit, and to aspire to national and general excellence. But the thing has been so done that that which has been and ought to

be in its constitution a great county and a national society, has been mistaken by the landlords of the county for a mere Aylesbury ploughing-match. I think the time has come when we ought to consider how we shall meet the difficulties of our position. How should we answer the question, Why is the great county of Buckingham inferior to Northampton? Why have we not those great exhibitions which are an example and incitement to all England? Now, I ask why do not these events take place in this county? I do not believe that it is possible for us to shun this question. My opinion is this, that you have made a mistake in mixing two things together which ought never to have been united. There are of course local qualities, accomplishments, and virtues, which only those who are on the spot can recognize and reward. Let those be attended to. Let us in this district maintain and fulfil those objects of a local nature; for I must confess my belief that all those local rewards which have been offered have hitherto been perfectly successful. At the same time let us by some decided step appeal to the county, so that we may have an annual exhibition of stock and skill which will test the position of the county of Buckingham in the country to which it belongs. This admirable address may be studied with advantage by the directors of other associations where the aim has been to farm out the premiums year after year amongst their noble selves and a few friends and neighbours, as to regard the stranger who can show a better animal with jealousy, or some yet stronger prejudices. It is contrary to the spirit of the age to imagine that a locality can advance proportionately with the rest of the world by keeping itself to itself; and even the best of men may grow weary of winning each other's money. As it was, the success of the show of Wednesday last was materially weakened, from prudential considerations having led to the withdrawal of the cattle, which would otherwise have supplied the chief feature of the occasion. There are a number of well-bred Shorthorns now to be found about Aylesbury, and the catalogue went far to confirm this; but, about a week since, Mr. Robinson, of Chilton Pastures, and Mr. Coleman, of Woburn, the appointed judges, were countermanded, and the actual exhibition confined to horses, sheep, pigs, roots, and poultry. These several sections were respectably filled, and amongst the cart-horses, without any particular deference being evinced for any fixed stamp or sort, there were many useful working animals. Mr. Mumford, of Chilton, took first and second in a good class of all-aged plough-horses: Mr. F. Cox, of Beachendon, the first prize, and Mr. Kingsley, of Boarscroft, the second, amongst the two-year-old geldings; and Mr. Terry, of Quarrendon, first and second in the companion class of fillies, where Mr. French, of Upton, showed another good one, and Mr. Rose a nice yearling, also commended, and out of his first-prize mare, where Mr. Bennett, of Rousham, finished second in the face of no further competition. The riding-horse classes scarcely came up to the standard which one would look for in the famous Vale of Aylesbury, although amongst the horses or mares for hunting purposes there were two or three very clever young ones by the Baron's horse, North Lincoln. The winner, Mr. Allender's three-year-old, is a very stylish taking colt, full of quality, and with noticeably fine action, having the walk of a race-horse. He is already known in the show-yard, having taken a prize at Oxford during the summer, and finished a close second in a good class at that great Peterborough meeting to which Mr. Disraeli referred so continually in the way of example. Acting on some extraordinary impulse, Mr. Denchfield, of Burston, entered a very clever yearling filly, also by North Lincoln, here, instead of in her own proper class, where she must have won; but his two-year-old, though the best yearling of last season, is grow-



ing a deal more like a harness-horse than a hunter. The dozen of hackneys were about the most incongruous collection ever brought together; and as there was not a decent goer amongst them, shape and make declared in favour of a really sweet mare to the eye, exhibited by Mr. G. A. Lepper, but bred by Baron Rothschild, by Kingston, and as thorough-bred as Eclipse, but not much of a hack to ride, though said to be a clipper with a collar over her head. The five nag yearlings entered for the Baron's Cup were a weedy lot, with the exception of the prize—a big-boned powerful black colt of Mr. Curtis', that looks like growing into money; though Mr. Denchfield's bay filly would have had an easy victory had she been entered here, and the judges were half inclined to have her back again. Hitherto, we hear, the offer of this cup has been coupled with a most extraordinary condition. Although given under the auspices of the Association, Baron Rothschild has stipulated for the appointment of his own judge, in preference to leaving this in the hands of the gentlemen nominated by the committee. Such a plan has worked nothing but satisfactorily, as at best but a bad compliment to the officers of the Society; and we would really suggest to the latter that, if only out of respect to themselves, they should respectfully decline to recognize any premium associated with any such terms. The class had far better be exhibited at the donor's own place.

The Oxford Downs find most favour here amongst the sheep, and Mr. Disraeli at the dinner claimed the first-prize cup for a protégée of his own, as "a cross between the Down and the Cotswold, so that the observations I made at one of your meetings last year have been sanctioned and confirmed by the opinion of your judges." The award, however, in favour of Mr. Morris's sheep was not so emphatically confirmed by the public, who rather went for Mr. Shrimpton's theaves as the best pen in the yard, and a very handsome uniform lot they were. Amongst the other winners for sheep were Mr. Treadwell, of Winchendon, with an old ram bought at Battersea of Mr. King Tombs, but tracing back to Mr. Gillett's flock; Mr. G. A. Lepper, second in the same class; Mr. J. K. Fowler, first and second for ram lambs; Mr. R. Fowler first, and

Mr. Badrick second for fat ewes; Mr. T. P. Terry, second to Mr. Morris' cup pen of fat wethers; Mr. T. Hughes and Mr. J. Osborne first and second for long-wool ewes; and Mr. Shrimpton first and Mr. Badrick second for Down or Oxford Down ewes.

There was a suspicion of disease amongst the pigs, so that Mr. Allender kept his Berkshires at home, and some of those exhibited were in quarantine; but Mr. Ducking's whites all the way from Lincolnshire were of course invincible; and Mr. Clarke of Haddenham with his Berkshires, Mr. Elliot of Hulcott, and Mr. Treadwell of Winchendon were also successful with some very smart pigs. Mr. J. K. Fowler is a really great man with "twenty pens of poultry" at his back; there were some capital collections of roots, and some clean lumps of butter fresh from the Aylesbury grass grounds; while on the plough Messrs. Ransomes and Sims were still emphasizing the success which has this season attended their career. Their man was again the champion ploughman, though the Howards won the day previous at Woodstock, and could not here come into competition, not having entered in time; but they had the satisfaction of seeing one of their ploughs win in the local class, and Mr. Taylor of Studham taking the silver cup as the owner of the prize team. There were also well-arranged prizes for farm-labourers, shepherds, herdsmen, and dairymaids, with ten pounds offered by the President of the year for the best collections of cottage-garden produce—very equivocal means to a good end, at least in the opinion of some people, though we rather concur with Mr. Disraeli in "the belief that all these local rewards have hitherto been perfectly successful."

The following gentlemen acted as judges:—

Horses: Mr. H. Corbet, Farmers' Club, London; Mr. Wiggins, Thumbley Hall, Worminghall. Sheep: Mr. Longland, Grendon, Northampton. Pigs and Ploughing: Mr. C. Hedges, Eaton Bray, Dunstable; Mr. J. Godwin, Troy Farm. Butter: Mr. T. Litton, Newgate Market. Root Crops: Mr. J. Lucas, Weedon Lodge; Mr. G. M. Allender, Shipton Grange. Roots in the yard and Vegetables: Mr. E. Stone, Wotton Underwood; Mr. J. P. Parrott, Ford.

## DERBYSHIRE AGRICULTURAL SOCIETY.

The annual meeting of the Derbyshire Society was held on September 20. The display of first-class stock was good, indeed there were few inferior animals exhibited. In the principal classes the entry was not large, but the stock which was sent was equal to any that has been seen in this part of the country for some time past. The horses were excellent; the mares and foals having never been surpassed at any meeting of this Society, and the whole of the classes were fairly represented. The show of pigs was poor. Some excellent specimens of sheep were shown, and in this department the show may be said to be fully equal to those of former years. The judges were—Cattle: Mr. Buckley, Normanton; Mr. Brough, Allsopp-en-le-Dale. Horses: Mr. Bland, Thorpe Lodge, Newark; Mr. Wright, Wanlip, Leicester; Mr. J. E. Bennett, Husbands Bosworth. Sheep: Mr. Dixon, Barff House, Beverley; Mr. May, Elford Park, Tamworth. Pigs: Mr. Lowe, Tamworth; Mr. Whitworth, Measham, Atherstone.

The following is the award of premiums:

### CATTLE.

Four cows for dairy purposes.—1st, 10s., J. Hodgkinson, Allestree; second, 5s., J. Brough, Kirk Langley; 3rd, 3s., R. Gibson, Swarkestone.

Pair of cows for dairy purposes.—1st, 5s., W. Fletcher, Radmanthwaite; 2nd, 3s., J. Foster, Thulston.

Shorthorned cow, combining in the greatest degree milking and grazing qualities.—1st, 5s., W. Fletcher, Radmanthwaite; 2nd, 3s., S. Wade, Mickleover.

Pair of heifers under three years old.—1st, 5s., W. Fletcher, Radmanthwaite; 2nd, 3s., J. Faulkner, Brethby; 3rd, 2s., J. Tomlinson, Allestree.

Pair of heifers adapted for dairy purposes.—1st, 3s., J. Porter, Weston-on-Trent; 2nd, 2s., J. Faulkner, Brethby; 3rd, 1s., E. Canner, Locko Grange.

Pair of stirks under two years old.—1st, 3s., W. Fletcher, Radmanthwaite; 2nd, 2s., ditto; 3rd, 1s., ditto.

Pair of stirks for dairy purposes.—1st, 3s., J. Faulkner, Brethby; 2nd, 2s., R. Sybray, Snitterton; 3rd, 1s., J. Milnes, West Hallam.

Shorthorned bull, two years old and upwards.—1st, a silver cup or plate value 5s., Charles Bosworth, Dishley; 2nd, 3s., R. Sybray, Snitterton Hall.

Shorthorned bull under two years old.—1st, 5s., J. Ironmonger, Measham; 2nd, 3s., Wm. Fletcher, Radmanthwaite; 3rd, 2s., E. Canner, Locko Grange.

Best yearling bull of the pure Shorthorn breed.—1st, 5s., W. Fletcher, Radmanthwaite.

For the best animal in the first 10 classes, a silver cup or plate value 5s. to W. Fletcher, Radmanthwaite.

Four rearing calves.—1st, 3s., J. Brough, Kirk Langley; 2nd, 2s., George Bryer, Markeaton; 3rd, 1s., J. Brough, Kirk Langley.

Fat ox or steer of any breed.—1st, 3s., G. J. Mitchell, Newton Solney; 2nd, 2s., W. T. Cox, Spordon.

Fat heifer or cow of any breed.—1st, a silver cup or plate

value 6*l.*, W. Fletcher, Radnanthwaite; 2nd, 4*l.*, W. T. Cox, Spondon; 3rd, 2*l.*, G. J. Mitchell, Newton Solney.

#### HORSES.

Brood mare and foal for agricultural purposes.—1st, a silver cup or plate value 5*l.*, J. Beeston, Mackworth; 2nd, 3*l.*, R. Gilman, Longford; 3rd, 2*l.*, W. Weston, Burley Grange.

Two-year-old gelding or filly for agricultural purposes.—1st, 5*l.*, J. G. Thompson, Chilwell; 2nd, 3*l.*, W. Bull, Egginton; 3rd, 1*l.*, E. Thompson, Breaston.

One-year-old gelding or filly for agricultural purposes.—1st, 3*l.*, J. Beeston, Mackworth; 2nd, 2*l.*, Mrs. Tatam, Little Eaton; 3rd, 1*l.*, R. Marple, Aston-on-Trent.

Brood mare and foal, for breeding hunters or hacks.—1st, 4*l.*, Eggleston Thacker, Ambaston; 2nd, 2*l.*, J. Pegge, Littleover.

Pair of horses for agricultural purposes.—1st, 3*l.*, W. Wilkins, Weston-on-Trent; 2nd, 2*l.*, Ann Eley, Hill Top, Longford.

Colt or filly, of the value of 50*l.*, not thorough-bred, under four years of age.—1st, 5*l.*, R. Sale, jun., Normanton.

Best cob, under 14 hands, for riding or harness purposes.—1st, 3*l.*, Mrs. Hartley, Kedleston; 2nd, 2*l.*, W. Chambers, Coxbench.

Best hunter, four years old and upward.—1st, 10*l.*, J. Stevens, Dale Abbey; 2nd, 5*l.*, G. Wheelodon, Derby.

#### SHEEP.—LONG-WOOLS.

Five breeding ewes, having had lambs in 1865.—1st, 3*l.*, C. Bosworth, Dishley; 2nd, 2*l.*, M. Scorer, Scarcliffe; 3rd, 1*l.*, C. Bosworth, Dishley.

Five long-woolled theaves.—1st, 3*l.*, M. Scorer, Scarcliffe;

2nd, 2*l.*, George Bryer, Markeaton; 3rd, S. Saint, Alkington.

Five long-woolled ewe lambs.—1st, 2*l.*, S. Saint, Alkington; 2nd, 1*l.*, C. Bosworth, Dishley.

Long-woolled ram of any age above a shearing.—1st, 3*l.*, T. Tomlinson, Hall Fields; 2nd, 2*l.*, ditto; 3rd, 1*l.*, Robert Sybray, Snitterton.

Shearling long-woolled ram.—1st, 3*l.*, T. Tomlinson, Hall Fields; 2nd, 2*l.*, ditto; 3rd, 1*l.*, M. Scorer, Scarcliffe.

Five long-woolled fat wether sheep, not exceeding 22 months old.—1st, 2*l.*, C. Bosworth, Dishley; 2nd, 1*l.*, ditto.

Best Leicester ram.—1st, 3*l.*, M. Scorer, Scarcliffe; 2nd, 2*l.*, T. Johnson, Kirk Ireton.

#### SHORT-WOOLS.

Five breeding ewes, having had lambs in 1865.—1st, 3*l.*, F. Camp, Etwell; 2nd, 2*l.*, J. Rose, The Ash; 3rd, 1*l.*, F. Camp, Etwell.

Five short-woolled theaves.—1st, 3*l.*, F. Camp, Etwell; 2nd, 2*l.*, John Ironmonger, Atherstone; 3rd, 1*l.*, ditto.

Five short-woolled ewe lambs.—1st, 2*l.*, John Ironmonger, Measham; 2nd, 1*l.*, F. Camp, Etwell.

#### PIGS.

Boar, of any age, most adapted for general use.—J. Hawthorth, Barton Blount; 2nd, 1*l.*, ditto.

Sow of any age.—1st, 2*l.*, Mrs. Eley, Longford; 2nd, G. J. Mitchell, Newton Solney.

Sow of any age, small breed.—1st, 2*l.*, Dr. Hewgill, Bpton Pig, the property of an agricultural labourer.—1st, 2*l.*, J. Moorley, Thulston; 2nd, 1*l.*, T. Ling, Markeaton; 3rd, 10*s.*, ditto.

## PLAIN SPEAKING AT LUDLOW.

### THE CATTLE AND OTHER FARMERS' PLAGUES.

At the dinner of the Ludlow Agricultural Society, on Sept. 18, Mr. Jasper More, who has succeeded Sir Baldwin Leighton as one of the members for South Shropshire, in returning thanks for the County Members, said, "There was a question which had engaged the attention of both France and England, viz., the cattle-plague. Now he was one of those who thought this subject had been very much exaggerated—that there was no ground for the panic which seemed to exist in many counties. On the other hand, he did not regret that the panic existed, because he thought it would educate England in that sanitary knowledge in which she had been especially deficient, and make her pay more attention to those matters of cleanliness and good ventilation of cattle-sheds, in which it was said she had been behindhand. He believed that the alarm was raised solely by Professor Gamgee writing a letter to the *Times* when that journal had a special dearth of information, in which he said the disease came from Russia, and which he was pleased to call by the German name of "rinderpest," which had nothing to do with Russia. They might perhaps recollect that Professor Simonds was in 1847 sent out for the purpose of investigating the Russian cattle disease and giving us an accurate description of it, and Professor Simonds said that that disease was totally different to the cases which had broken out in this country—that, in fact, there was nothing in common between them. Professor Simonds laid it down that a cow attacked with the Russian plague was always subject to twitching spasms of the mouth, which were totally wanting in the cases which had occurred in this country. But although it was of little moment whether the disease came from Russia or Germany, it was most important it should not be stated there had been cases of cattle plague here unless it were really the case. He had exchanged information on the subject with many practical anatomists, and he felt that there was more alarm than there was occasion for. The cow, it was well known, was more subject to blood disease than any other animal; and there were diseases common to animals all over the world; for instance, distemper in the dog, influenza in the horse, and bronchitis in the pig; and with regard to sheep, the smallpox and many other diseases, which, with the diseases

of the cow, would fill half a veterinary dictionary. He thought, therefore, it was more than probable that many of the cases which had been related in the *Times* were not rinderpest, but simply mere ordinary diseases to which the cow might as well be subject ("Oh, oh!" and marks of dissent). And this view led him to ask whether they thought it desirable to form those associations which were so much recommended on all hands. He found it was proposed that irresponsible bodies of men should collect capital and distribute it as they pleased, without any practical guidance as to the actual nature of the disease (No, no); and he thought it was doubtful whether it was to the interest of farmers to join those associations without careful consideration. About a century ago cattle disease broke out in England, and he should be happy to show them—from *The Gentleman's Magazine*—the almost parallel opinions with those of the present day which were then expressed, both as to the nature of the disease, the country it came from, and the remedies to be applied. And it was a most important fact to notice that the longer it remained in England the milder the form it assumed; while the best remedies were found to be the keeping of the cattle in a strong and healthy condition to resist the attack ("Oh, oh!" and laughter). An eminent man last week told him that the same treatment should be applied to a cow as a physician would apply to a patient in a case of typhus fever, viz., good living to enable the disease to be resisted; that as the contagion was floated here and there, it would be likely to pass over animals which were kept in a good condition and a state of cleanliness. Last week he was in Birmingham, where he met theoretical and practical men, and where he went to the Veterinary College and asked if he should be safe in promulgating the views he entertained with regard to the cattle plague. The answer he got was—"We believe that time will prove you to be right; but if you address your views to any company of farmers in the present state of the public mind, they will all be against you" (Oh, oh). Well, he was not a man afraid of expressing his opinion, whether the company to whom it was addressed agreed with him or whether they did not (applause).

Mr. MATTHEW EVANS was called upon to reply for the unsuccessful exhibitors. After a few remarks pertinent to the

lost, he said: We have had a great deal of talk this evening but a very little bit of business. We have had some extraordinary speeches about the cattle plague, and a good deal of laughing at what Mr. More has said. But I quite agree with Mr. More, that there is a great deal more said about the cattle plague than is necessary. It does not exist in our neighbourhood, and I hope it won't; but, if it should break out, if proper precautions are taken, it will not, I think, be very bad. But there are a great many plagues in this country of which gentlemen at the head of the table on such occasions as these never take any notice. One of those plagues is the game-law: that is a great plague to the farmer—at least it is a great plague to me to see a gentleman's gamekeeper coming over my farm and I cannot have the privilege of giving a friend a day's sport (Hear, hear). There are many other things which are a great plague to me; and, instead of our talking about the cattle plague all the evening, I think it would have been much better if Mr. More, Capt. Clive, Capt. Severne, or anybody else, had told us how they have tried to relieve the farmer by introducing a proper Tenant-right Bill, under which he could get fair compensation for the capital he has expended in improving the land—something that he could fall back upon if he should happen to see the keeper breaking down his fences and treading down his turnips; for it is the keeper and his friends who are the trespassers. But instead of these things we have been going on all the evening about this bugbear of the cattle plague; and Mr. Powell, I think, was quite right when he described us as "nogmen" and "cloodlopes"; [for when there are big men present you are afraid to speak ("Oh, oh!" applause and disapprobation). Are not your motives as pure and honest as your landlords'? Don't you pay him your rent, solely to improve his land? Is it not fair, then, that you should ask to be put in such a position that, if anything happens to your family should receive the benefit of your skill and capital? But you don't say a word about this. You talk about the cattle plague, and the army and navy, and such things as those; but I say let us tell our landlords this—We ought to be fairly reimbursed for the money we lay out in improving your estates (applause). Tell us how that is to be done, and that you won't send your keepers to break down our fences and kick our turnips about in looking after game. It is a disgrace to the country that when you catch a poacher you don't prosecute him at your own expense, and not out of our pockets (Hear, hear). I don't want to hear such twaddle about the cattle plague and other things that don't concern us; but I want you to devise a plan to give tenants proper compensation, and not, when we have expended our capital in improvements, to send a man who is called an agent to raise the rent—

Mr. NEWILL: Name, name.

Mr. EVANS: Well, I will take my own case as a tenant under Mr. Knight, of Henley. I laid out £800 in improving the land and got no compensation, and then it was let at an increased rent. Mr. Clark is his agent.

Mr. CLARK: I contradict you.

Mr. EVANS: How contradict me! Didn't I pay my rent, and didn't I farm the land better than any other man on the estate? I can give you fifty cases where men have improved their farms and got no compensation; and I mean to say those men were wronged (Hear, hear). At agricultural meetings I want to hear landlords say—Farmers, improve your estates as much as you can, we will never take advantage of you. But did you ever hear gentlemen say that? No; what we hear is a little bit of twaddle and a little bit of humbug (cheers and disapprobation). These associations are for the encouragement of good farming and good husbandry, and the improvement of the condition of the labourer; but we don't hear much about those things. I beg to thank you. Perhaps I have said more than you like, but I could say a great deal more (cheers and disapprobation).

Mr. L. L. CLARK (the agent): I came into this room this evening expecting and hoping to see happy faces—that politics would be ignored—that the progress of agriculture would be considered—and that those relations existing between landlord and tenant, where there was a necessity, would be fairly discussed (Hear, hear); and as my name has been mentioned, perhaps I may be pardoned for saying one or two words in

reference to the subject. I will enter very briefly into Mr. Evans's particular question—[Mr. EVANS: Not a question; mine was an answer]—about which he has thought it necessary to introduce my name. Now, Mr. Evans had formerly a very small holding under Mr. Knight, of Henley, of whose estate I happen to be the agent. [Mr. EVANS: It was 40 acres, at £100 a year.] Mr. Evans has told you he spent £500 upon it. [Mr. EVANS: I spent £700.] Well, I don't know what the amount may be, but whether £500 or £700 it was a very large sum to expend on a grass farm having only one arable field of five acres on it (Hear, hear). Mr. Evans at the time he took that property was resident in this town, keeping an inn; but subsequently he went to reside at the Craven Arms, where I think he has not found agriculture, connected with innkeeping, has been a very unprosperous proceeding, notwithstanding the game and the gamekeepers of which he complains—whether justly or unjustly it is not for me to ascertain. But when Mr. Evans went to the Craven Arms he became a non-resident here, and I would ask any owner of land whether it is usual to keep as occupier a person who resides nine miles off (Hear, hear). Formerly, as I say, he was resident here, and no doubt the land had all those advantages which arise from high manuring, for I will do him the justice to state that he did his land very well; but having done that, he had no just ground, if he felt that he had not had his improvements justly considered—for these things are constantly arising in every-day life—this, I say, is not an occasion on which a man is to be held up to a public meeting of the two counties of Hereford and Salop. [Mr. EVANS: Was I not asked to name?] We don't come here to discuss private disputes between landlord and tenant (Hear, hear). I don't say whether Mr. Evans is right or wrong; but I say that your time is improperly taken up, and that, looking to the objects for which the association was established, it is beneath this meeting to enter on the consideration of such a subject. If Mr. Evans did spend £700 on a small holding, having only one arable field of five acres, I can only say it was a very large outlay, and that if every gentleman who farms would spend his money in the same proportion we should not have much complaint of small crops. When a gentleman whom I represent is referred to on such a matter, and when my name is called in question, though I wish to say nothing personal to Mr. Evans, I must express my opinion that this is a question which ought not to have been introduced here (applause).

Mr. EVANS: I was asked by Mr. Newill to name, and I did so. I am not to be put down by you or any other man in the company. I have not only named, but I will prove what I have said.

Sir Charles Boughton, Mr. Boughton Knight, and some others here left the room, and for a time considerable confusion prevailed. The business of the evening, however, was partially resumed, when, according to the *Hereford Times*, a tolerably strong opinion was expressed as to "the attempt made during the evening to hunt down Mr. Jasper More, who had been returned to Parliament by the tenant farmers of South Shropshire against the influence of the Tory landlords."

**THE USE OF TAR-WATER IN THE CATTLE DISEASE.**—The murrain which has lately raged in many parts of Europe among the horned cattle, and now prevails in some parts of England, should engage our attention to prevent the spreading of so destructive a malady. As this distemper appears by its symptoms to be a kind of fever, it is recommended that tar-water be tried in the following manner: Let the sick beast have poured down its throat a quart of warm tar-water made stronger than usual by stirring each gallon eight or ten minutes, and this to be repeated every hour or two for the first day while the sick beast is awake. On the second day let one-half of the former quantity be given; and on the third day half of that which was given on the second, which last quantity is to be continued till the cure is perfected, during which time the beast should be housed and lie warm.—From *"A Narrative of the Success of Tarwater,"* by Thomas Prior, Esq., 1746.

## THE CATTLE PLAGUE.

SIR,—If you think all or any part of this letter respecting the cattle plague, which I forwarded yesterday to the Lords of the Privy Council, fit for your columns, it is at your service.

I am, sir, yours obediently,

EDWARDS CRISP, M.D.

48, Beaufort-street, Chelsea, Sept. 22.

TO THE RIGHT HON. THE LORDS OF THE PRIVY COUNCIL.

MY LORDS,—When the cattle plague first made its appearance in this country, I placed before the Clerk in Waiting various documents, to show that I had for many years been investigating the diseases of the lower animals and of plants, for the purpose of throwing light upon human pathology and treatment, believing that in the study of disease the same system should be pursued as in the study of organized beings—viz., the ascent from the lowest to the highest, a mode of investigation which, I believe, is exclusively my own. Among the publications forwarded were my prize essay\* on “Lamb Disease” (awarded by Lord Portman), my essay on the “Causes of Death of the Animals dying at the Regent’s Park Gardens from 1851 to 1862,” my essay on “Splenetic Apoplexy in the Ox, Sheep, and Horse” (a disease that kills sooner than the cattle plague), and a numerous list of my papers and morbid specimens of diseases of the lower animals exhibited at the Pathological Society of London. I have, moreover, made the largest collection of the diseases of the lower animals yet formed (many of them in wax). I offered my services to the Government, to investigate the cattle murrain in this or in any other country; and I presume to think, my Lords, that, if my offer had been accepted, I could ere this have placed before the Government and the people such a history of the origin, cause, extension, mode of prevention, &c., of this disease, as would have been of service to the country and to the cause of science.

In answer to my letter to Sir G. Grey, I am informed by Mr. Waddington that the appointment of inspectors is made by the Privy Council. Believing that my long and unrequited labours in the cause of science entitle me to a better and more useful post than that of a cattle inspector, I shall, in proof of this, take the liberty of placing before your lordships, from time to time, certain facts connected with this disease that will, I hope, throw some light upon the subject. The inquiry is one of national importance; and I can, therefore, well afford to incur any charge of presumption and vanity that may be brought against me. I am emboldened to take the course I am about to pursue from the perusal of the very lengthy document by the German professor, Dr. Thudicum, under the direction of the Privy Council—a document that has excited (justly or unjustly) the ridicule of almost every farmer in England.

Let me first place before your Lordships the line of investigation that I have chalked out, in studying this disease; and then, without following the programme, I will in this and other papers touch upon a few points that I consider of immediate and pressing importance.

1. A brief history of epidemic and endemic diseases in man, in the lower animals, and in the vegetable kingdom.

2. The history of the cattle plague in this and in other countries; its variation and abatement, according to season, locality, and the precautionary measures adopted.

3. The origin and cause of the disease in this country, the localities in which it has appeared in the United Kingdom, with statistics of age and sex, the number of animals affected, and the amount of mortality.

4. The symptoms, duration of the disease, and its morbid appearances, especially in relation to the microscopical and chemical condition of the blood.

5. Is the milk or flesh of animals affected with this disease injurious to human beings when taken as food?

6. What resemblance does the disease bear, in the symptoms and morbid appearances, to the typhus, or typhoid fever, in the human subject?

7. Is the disease now prevailing the redpest of Prussia?

8. On the parasitic origin of the disease?

9. The normal visceral anatomy of the ox, sheep, and other ruminants, with a view to ascertain the peculiarities in the structure of the bovine family that especially render them liable to be affected by this mysterious poison.

10. The most practical and efficacious means of prevention, especially as regards the prophylactic treatment by the internal administration of medicine and the distribution of gases through the atmosphere.

11. An estimate of the success attending the various modes of treatment, with suggestions as to the best methods to be pursued.

12. The best and most practical modes of disinfection, and an investigation as to the efficacy of chloride of lime, and other agents as disinfectants.

13. On the importation of foreign cattle as a means of engendering the disease, with practical suggestions for the better regulation of this import in future, and on the necessity of restrictions in the conveyance of cattle by rail.

14. A general summary of the above, with practical considerations for the guidance of the Government, of agriculturists, cow-keepers, and stock-dealers.

As I said before, my Lords, it is not my intention to trouble you with the series of investigations enumerated above, but rather to place before you, from time to time, such selections from my labours in this field of research as I believe will be practical and useful. A great difficulty presents itself at the onset in the proper investigation of this disease, in consequence of there being no scientific central authority in this country, to which the Government can refer in a calamity like the present; and the same remark will apply to the medical profession. We have in the one profession\* nineteen licensing bodies, all requiring different *curricula* and different examinations; and in the other a college granting a degree, but one which is not compulsory; so that nine-tenths of the veterinary practitioners of this country have had no proper education or examination! Again: let us look to agriculture, where, instead of an agricultural university and museum (the establishment of which I have long publicly advocated), where a good education might be obtained, degrees granted, and professors paid by the State, some of whom might be consulted in such an emergency as the present, we have another club (of which I am a member) in the shape of the Royal Agricultural Society, who eke out education by driblets at their model establishment at Cirencester. My Lords, all is clubism in this country, and there is nothing national or universal about any one of our scientific institutions. But let me suppose, my Lords, for the sake of exemplification, that when this “cattle plague” first made its appearance we had had in this country a representative Faculty of Medicine in England, Ireland, and Scotland; a veterinary college in each of the three kingdoms, the examination at which all who (as in France) act as veterinarians would be compelled to pass; and an agricultural university, in which the study of the lower animals would form an important item in the *curriculum*; and that selected from these faculties or colleges a commission had been formed to investigate this disease and to report upon it; is it likely, my Lords, that many important matters would be in the same state of doubt and uncertainty as at present? Let me explain. In the lengthy document by Dr. Thudicum (approved of by the Privy Council), constant reference is made to the use of chloride of lime: “A healthy animal is to be washed with chloride of lime, with tepid water; then fodder, both dry and green, is to be given; then sop and pure cold water; and next, the animal is to be rubbed dry with whisks of straw and hay.” My Lords, there is no proof whatever that chloride of lime will prevent the noxious effects of this

\* None of these are sold for my own benefit, or I should not have noticed them.

\* See my evidence before the Parliamentary Committee on the Pharmacy Bill Blue Book.

poison when received by the lungs, its ordinary and perhaps sole mode of access; but assuming that the poison may be introduced by the skin, I can conceive no method so likely as this washing, wetting, and rubbing, to effect the introduction of the poison; and as to "pure water," everybody connected with cattle knows that these animals give the preference to, and do better upon, the water of ponds and ditches, which is so impure that it would be considered unfit for human beings. The occurrence of this disease is not a question of *health*. A diseased animal would probably be more likely to escape the malady which the strongest and healthiest readily succumb to. As I shall have occasion to allude to this curious document hereafter, I will for the present confine myself to the chloride of lime question, viz., Has this substance the disinfecting influence imputed to it? How are we to determine this? My Lords, if the imaginary commission I have spoken of had been formed, a large sanitarium or hospital would have been established in an open space near London, where experiments might have been made to determine this and fifty other matters that are now in doubt and uncertainty. Experiments to be useful must be performed on a large scale; few and isolated experiments only lead to false inferences. To such an establishment formed by the Government, diseased animals, in closed vehicles constructed for the purpose, might have been taken; cows and oxen of little value might have been surrounded with chloride of lime, and introduced among the diseased animals; others that had had their systems saturated with sulphur, tar, salt, and many other substances, might have been similarly tested; and medical and other modes of treatment might have been tried, and in this way, as I believe, a vast number of important facts would have been elicited. On the score of cruelty some would object to these experiments; but they (the experiments) would be "cruel kind," as the Irish say, as the sacrifice of the lives of a few cattle might be the means of saving a large num-

ber, and the extension of the malady by such a method as I advocate would not, I believe, be likely to occur.

In my next letter, my Lords, I hope to speak of the prophylactic treatment, viz., Can we by any method of internal or external medication so affect the blood of a bovine animal as to render it insusceptible of the noxious influence of this mysterious poison?

Before concluding this, my first letter, let me, my Lords, urge upon you the necessity of *at once* placing restrictions upon the conveyance of living cattle by railroads: it is by this means that the disease has been quietly disseminated and conveyed to almost every part of England; and I think that the transport of all living cows, bulls, oxen, and calves should be at once prevented, and all large gatherings of cattle at fairs and agricultural shows prohibited.

Dead-meat markets should be established in various parts of London, and in all our large cities and towns; and the flesh only of oxen, cows, and calves should be admitted, when properly dressed, and inspected by competent persons. I am aware that such a prohibition would excite a great deal of opposition and discontent in certain quarters; but the necessity of taking stringent and active measures for preventing the spread of this disease is so urgent, that all should be willing to make sacrifices for the general good. All foreign cattle (like our homebred beasts), for the present, should be slaughtered out of London, and the flesh sent to the dead-meat market, after proper inspection; and so at all our seaports where foreign oxen are landed.

I have the honour to be, my Lord,

Yours respectfully,

EDWARDS CRISP, M.D.,

late Physician to the Metropolitan Dispensary.

42, Beaufort-street, Chelsea, Sept. 21.

## MISS BURDETT COUTTS ON THE CATTLE DISEASE.

This lady has written the following on the ravages of the cattle disease:—

"Holly Lodge, Highgate, Sept. 8.

"Herewith I enclose my bailiff's report of the cattle plague which has visited my dairy. I should have sent it earlier, but that my bailiff and herdsman went to the seaside for a few days, and that I have also been myself extremely occupied with the various orders necessary to be given to avoid perpetuating the disease.

"In the presence of so alarming a visitation one feels an amount of individual responsibility for all one does or leaves undone. I therefore do not scruple to lay before you the reasons which induce me to adhere to the opinion that the disease is the Russian murrain, brought in by imported cattle.

"The conclusion as to the source of the disease, come to by a perfectly impartial person, who has been face to face with the disease, may not be without use, and it is needless for me to say that it is a matter of perfect indifference to me which of the three theories put forward may ultimately prove to be correct—

"1. The state of the cowsheds of London.

"2. The state in which imported cattle are allowed to come into our market.

"3. The Russian murrain.

"Of the two first, allow me to say that it appears to me a disgrace to our legislation, and wholly at variance with our professed civilization, not to say religion, that it should be possible even to advert to these as the most probable sources of this disease. But whatever other diseases these sources may by a retributive justice give rise to among us, I cannot myself look upon them as those of the present plague. Possibly a peculiar condition of the atmosphere may call into sudden action evil which has long lain dormant, and the cowsheds, cattle vessels, and railway trucks may, on this supposition, be connected with this outbreak of the evil; but it strikes me as singular that this evil should take the precise form of the rinderpest, when we consider that all the conditions of life and climate in England and the Steppes of Russia are so wholly different. With the exception of the outbreak of 1745,

England has not suffered from this disease, so well known in northern Europe. But I understand that, until lately, we have not imported cattle from Russia, and our immunity has been doubtless due to the precautions taken in Germany to prevent its ravages in that country. This year cattle have been imported direct from Russia, and I have been informed that about three months since an inquiry was made at the Islington Market 'as to whether there were any restrictions upon Russian cattle.' The question implied a suspicion that such instructions should exist, and suggested the reason for them. It is surely a singular coincidence that the sources of disease, always existing amongst us, should cease to lay dormant, and burst forth into Russian murrain simultaneously with an importation of cattle from that country, and should exist with the greatest virulence in the very market to which it is generally supposed the largest portion of the herd was sent. I am aware that it has been reported that Hull, where the animals were landed, has not been visited by the disease, and that it cannot be traced with certainty into the London market from the sale of this herd. But as it is also asserted that there are no means whereby English and foreign cattle can be distinguished in the market, I do not see how the absence of the animals can be affirmed with any certainty. The one fact remains uncontradicted, that a cargo came from Russia, and is dispersed somewhere about the country. I do not, however, form my opinion as to the origin of our present distress upon this fact solely, but I also find in Dr. Budd's report upon the rinderpest an explanation of many of the peculiar phenomena it has exhibited, and for which we seek to account. I did not read, as I should not have understood, the purely medical portion of Dr. Budd's report; but I believe that though the symptoms of the disease in England may have been modified by climate, water, food, and other influences, yet its course during its progress and at its close in death corresponds to the course of the disease as described in Dr. Budd's report. His account of the rinderpest is the more significant and valuable from the circumstance that it was written without reference to the existence in England of the disease now prevalent among our cattle, and that the similarity between the two diseases

has not ever been, to my knowledge, denied. I therefore assume this to be the case, and I cannot but think Dr. Budd's observations offer a clue to much that perplexes us in the manifestation of this complaint. He states that those animals suffer most from the rinderpest who have never had it in their race; for instance, the young of animals who have gone through the disease take it more mildly and transmit the tendency to its influence in a modified form. He also observes that no animal takes it twice. In these two points it bears an analogy to diseases common among us, such as small-pox; and, as in these diseases there are exceptions found to rules otherwise general, so similar exceptions might possibly be found in the rinderpest; still the rule remains. Another important piece of information to be found in the report is this, that while sheep, dogs, and other animals are impervious to the disease, they can convey its poison. Now it seems to me that these observations would account for the phenomena we have observed:—

"1. The sudden breaking out of the disease in various parts of the country and under very different conditions.

"2. The immunity of the animals of one shed and the virulence with which it attacks those of an adjoining shed.

"3. The severity with which it has usually attacked English bred cattle.

"We could thus account for the circumstances observed in Hull. Of the 300 beasts landed, there is no reason to suppose that all were sick, and the healthy may have remained at Hull or in that neighbourhood, or all may have been sent away, the sick to carry pestilence, while of the healthy no trace would be found. The infected cattle might herd with home-bred cattle peculiarly liable to take the disease, or with imported cattle less likely to take it for the reasons assigned by Dr. Budd; and possibly some of our own herds of home-bred cattle might take it less severely from its having been in their race, for we should bear in mind that we have had the disease in England in 1745, and that it then lasted 14 years, notwithstanding the strongest measures taken by the King in Council to prevent it. Of course it would require long and patient investigation and observations to prove or disprove these suggestions. The same train of reasoning would also apply to the Dutch cattle imported from Holland, which have suffered cruelly. Most of them would be, like our home-bred cattle, peculiarly liable to complaint. Holland is usually guarded, like ourselves, from its inroads by the precautions of Germany for its own safety. We know, however, that in 1857 the disease penetrated into Prussia. I do not know how far it was checked by the strict cordon kept to exclude it, or how far its influence extended; but during a time of war such cordons are not easily maintained, and some animals conveying the plague may have come to our shores either through Prussia or Holland, where the cattle have been said to be sickly for some cause or other for some time past.

"My own conviction, that we have the rinderpest among us, is so decided that I venture earnestly to press upon your attention the urgent necessity for a systematic attempt to discover an effectual mode of treatment. We cannot altogether prevent importation, and when this panic has died out people will again become careless; and though I heartily hope that the system of bringing the poor creatures to market may be humanized, and the state of our cattle-sheds permanently amended, still efficient inspection can never be relied on except under the pressure of danger; and the signs of the disease are so peculiarly subtle as to elude even careful and self-interested watching.

"I might have said innocently the day before its seizure the worst case. I had in my dairy a cow with a calf I was particularly anxious to save, and which had remained apparently healthy throughout the previous fortnight, while the disease was at its height among the other cattle. Would it be impossible for the Government to select a certain number of chemists' shops, as depôts, in different parts of the town (such as Savory and Moore, in Bond-street), where information as to the signs, especially the early signs, of the disease could be procured, together with certain information as to the medicines and modes of treatment which had been found curative, or even which mitigated the form of the disease? It would be important to alleviate the sufferings the animals endure, and to render their bodies less dangerous when dead. I am about to set some inquiry on foot myself on these points. A few gentlemen kindly give me their help. May I hope for any assistance from Government in carrying out my project? There

are several other very grave subjects on which information is greatly needed. Is the meat of diseased animals fit food for man or for animals in any stage of the disorder? I have heard of sickness lately in kennels. Can this be attributed to the meat given to the dogs? The milk also, is it fit for use, either during the attack or immediately after it? Some of my cows gave milk after doses of bisulphate of soda. I did not allow it to be used, but it could scarcely be expected that others should do this whose livelihood depended on their supply of milk; and, if unnecessary to be done, the waste would be equally to be deplored.

"On the recovery of the only cow saved out of my herd of 20, the milk was given to some pigs. They rejected it at first, and, after taking it, sickened slightly. I forbade its use for a week. Surely it is a point of great importance to the public health, and should be ascertained, and inspectors should have the power of certifying that an animal is or is not in a fit state to be milked.

"At present no one knows where to turn for any advice, and it seems to me, and I believe I may add that I represent the opinions of many, that upon such an occasion as the present our Government should take the lead in guiding us how to act, and in assisting us to meet an emergency which is full of difficulty and danger to all classes. According to the account of the murrain drawn up in 1745, the spring months proved the most severe, while it slumbered in winter. We must not, therefore, reckon upon its ceasing with the year; nor should we forget that we have not the cold which in Russia, I presume, checks the infection, and the absence of which accounts for the still greater severity with which it is said that the disease has visited Egypt, which is afflicted with this as well as with cholera."

## RULES FOR ROAD LOCOMOTIVES.

2. One of such persons when locomotive in motion to precede it on foot by not less than sixty yards, and to carry no flag constantly displayed to warn riders and drivers of approach of locomotive, to signal the driver thereof when it shall be necessary to stop, and to assist horses, &c., passing.

3. Drivers to give as much space as possible for other traffic.

4. Whistle not to be sounded for any purpose.

Cylinder taps not to be opened in sight of person riding, driving, leading, or in charge of a horse upon the road.

Steam not to be allowed to attain a pressure exceeding limit fixed by safety-valve, so that no steam shall blow off when locomotive on road.

5. Locomotive to be instantly stopped when required by person preceding same, or any person with horse or carriage putting up his hand as a signal.

6. Person in charge to provide two efficient lights, to be affixed conspicuously, one at each side, on the front of the same, between the hours of one hour after sunset and one hour before sunrise.

Penalty on owner for non-compliance with all or any of the above not exceeding £10; but the owner may recover the penalty of the person in charge of, or in attendance upon locomotive, on proof that the same was incurred by reason of his negligence or wilful default.

Waggons, &c., drawn by locomotive, and loaded with materials now exempt from toll, to be exempt as if drawn by animal power.

N.B.—Thrashing machines, and the steam engine for working a thrashing machine, are exempt from toll.

Locomotive not to be driven along turnpike-road or public highway at greater speed than four miles an hour, or subject to the regulations which may be made by local authorities, through any city, town, or village at greater speed than two miles an hour.

Penalty not exceeding £10.

The weight of locomotive, and the name and residence of owner or owners to be affixed thereto in conspicuous manner.

Penalty as to weight, not exceeding ... .. £5

Other particulars, not exceeding ... .. 2

For fraudulently affixing incorrect weight, not exceeding ... .. 10

Nothing in acts contained is to authorize any person to use locomotive so constructed or used as to be a public nuisance at common law, nor to affect right of any person to recover damage in respect of injury sustained in consequence of use of locomotive.—*Road Locomotives, by T. Aveling.*

## THE TENANT FARMERS OF ENGLAND.

BY A PRACTICAL FARMER.

From time immemorial it has been asserted, and it has hitherto been taken as a fact, that the interests of the landlord and the tenant farmer are identical; and therefore all the tenant had to do, or expected to look for, was the protection, the support, and guidance of the landlord, and most assuredly so in matters political, and to such an extent that his wishes and opinions were never consulted. All he had to do was to vote for his landlord at the county election, and woe betide him if he failed to do so. Now this might be politic and reasonable in the "good old days" of feudalism and claniship, when the farmer was more the retainer than the tenant, and yielded his lord liege service for the measure of protection and safety he enjoyed under him; or, to come nearer to our own days, when, as it was still said, "the farmers were as dull as the clods they cultivated," and when they were disposed to yield themselves to a kind of voluntary serfdom, boasting of their long lines of ancestry under this noble Duke or that noble Lord—all right enough in its place, but the occupiers could not break away from their feeling of serf-like dependence, and assert a manly independence of character and conduct. Well, it might be all very well in those days for aristocratic family influence to hold a kind of despotic sway, and thus carry county elections, and assume other great powers; but these days have passed away before "the march of mind." "The school-master has been long abroad;" knowledge has been universally diffused, and that of every kind. We have a cheap literature; our press teems with papers and periodicals; our country is filled with associations for the improvement and advancement of every class of the community. In agriculture such associations abound everywhere, and agricultural advancement has become the wonder of the times. Yes, poor despised agriculture has taken a position in the world's progress second to none. It is taught in our colleges, it is practised in our laboratories; engineering skill and mechanical science have achieved wonders for it: but the fulcrum upon which the lever rests that moves the whole is the tenant farmer. His acquirements and growing intelligence, his skill and enterprise, his judicious tact and management effect the whole. All this is more than acknowledged by landlords. We have heard noble Dukes and noble Lords address their tenants individually as private friends, and, what is better, seen them treat them as such. This is in a great measure attributable to the abounding agricultural societies, which have broken down those haughty barriers in every district by which high-born families were held aloof from their tenantry. They are now fain to acknowledge the tenant farmers of England as an intelligent and increasingly independent body. It is to this general acknowledgment of their knowledge and importance as a class by the aristocracy of the kingdom that I wish to draw attention, as a proof of the desirable position to which the present tenant farmers of England have attained. Undoubtedly they have attained a high and most important position in the general economy of British interests and British industry. They have established themselves as a class. They have attained it by their own energy and acquisitions of knowledge; they will continually thus improve their position, and they will uphold it by their indefatigable perseverance and the extent to which they will benefit the state by a vastly improved and developed agriculture. The tenant farmers of England are now a

most important class, and as a class they must look after their own interests. Landlords have no power to aid them; their power generally and the identity of interests no longer stand so paramount as they did. The landlord is, and will ere long be more and more beholden to a skilled and enterprising tenant. Just let us refer for a moment to this identity of interests. First, the game laws—of what value are they to tenant farmers? He has to feed game for the landlord, and for which he must make ample provision. In many cases he must sow a crop expressly for them; in others he may mow his grain crop, but he is debarred from raking up the dropped stems. Again, he must not mow at all—stubbles are good cover for game. Again, his fields are planted with thorn bushes to prevent netting, there to remain. Of what use are our scientific improvements to him? What of autumn culture, that best of all improvements? He cannot break up his land immediately after harvest. Of what use is steam cultivation to him, or skeleton ploughing or broadsharings? Then he must not touch the game; "no-trespassing" gamekeepers and informers see to that. Fie upon the game laws! they are a curse to agriculture. Then there is the malt-tax. Most farmers say it is a grievous burthen to them—a tax upon the barley grower. Landlords don't trouble themselves much about its removal. Again, there is the tithe, a very heavy burthen, and one laid upon land with much propriety when land was the basis of wealth and the population thin, poor, and scattered; but landlords never trouble themselves to divide this burthen upon the basis of population, instead of upon land only. Land has now no more right to exclusively support the Church Establishment, than to support the whole order of Government. Population, and not land, should now be its basis of support. Then there are many minor matters which landlords care but little about. There is the question of agricultural statistics—a question which is very interesting to the tenant farmer, and, if carried, would prevent him doing his business in ignorance of supplies to any extent. The landlord's dogs may worry his tenant's sheep without redress, or, at least, a tardy one. The parochial roads may be covered with grass up to his saddle girths, but his tenant's stock must not take a mouthful. All parochial offices fall to the tenant, or nearly so—some of them troublesome enough, the tenant doing the work, the landlord retaining the direction. I would be the last to impugn landlords as a class; but, if they don't look closer after the tenant's interests, his rights and privileges, he will soon turn politician, and endeavour to right himself. I rejoice to see most unequivocal tokens of this movement during the past election of the House of Commons. The tenant farmers of England are quite certain that inexperienced young lordlings (Lord Dundrearys), or unbusiness-like young squires, are no representatives for them, and they are beginning to select men of their own order. Yes, and they will too. What is to prevent them? Landlords may threaten, they may punish, they may change tenants, and that often, the oftener the better to bring the question to a settlement; but it will be all one in the long run. And why? It is this: there cannot be a doubt as to the class of men who now guide or rule the British nation. It is the intelligence of the middle classes. It is their knowledge, their energy, their requirements, and their enterprise that keep the wheels of Government in safe



progress. And is it to be supposed that the rapid increase of knowledge and importance, so lately attained by the tenant-farmers, will remain without its influence? Depend upon it, they will soon be fully aroused to their own interests. They will soon be heard in the Senate, and they ought to be heard. I hail the first movement of this order. The county of Norfolk has once more taken the initiative. It was the first to commence a new era in British agriculture. It is one of the first to send a genuine tenant-farmer to the House of Commons. I hail the return of Mr. Clare Sewell Read as a great triumph of the tenant-farmers of East Norfolk. He is a good type of the intelligent tenant-farmer, and is a man well known to the agricultural body. He is an excellent man of business. He is a first-class judge at our agricultural meetings. He is a clear and comprehensive writer on agricultural subjects, and he is a ready and pithy speaker. He has long been before the agricultural public, and has proved himself a sterling man. One fact I will name to his honour. While agent of a noble Earl, he was urged to enhance the rental of the estate; but feeling assured that it would be inequitable to the tenantry, he chose to resign his agency rather than do so. It is not every one that would act so nobly. He owes his elevation mainly to his consistent advocacy of the tenant-farmers' interests.

Nor is the county of Cambridge far behind; indeed it takes precedence, having elected Mr. Ball, a tenant-farmer, as a protectionist, when the battle of free-trade was fought. Now, the tenant-farmers of Cambridgeshire have ousted a young squire, and replaced him by an excellent man of business in Mr. Young, who, although not precisely a tenant-farmer, has all his days been brought up amongst them, and is one with them in heart and mind. Mr. Hope, of Fenton Barns, was also put forward, as a tenant-farmer, for a Scotch constituency. These, and instances like these, show and foretell a political power which will ere long be wielded by the tenant-farmers of England. They will elect representatives of their own, in considerable numbers, so as to make a stand in the Commons House of Parliament for their own benefit and rights. They will no longer be "tools," but independent men who can and will think and act for themselves. We live in an age when mind predominates over wealth and power, and takes its proper and beneficial influence. The agricultural mind, which has so long been grovelling under the pressure of prejudices and custom, not to say ignorance, is now becoming fully developed, and must take its place in the foremost rank of intelligence and worth; agriculture itself, a nation's soundest trust, becoming one of the highest applications of science and skill.

## THE ERVUM—A NEW FODDER PLANT.

[TRANSLATED FROM THE "JOURNAL D'AGRICULTURE PRATIQUE."]

*Acclimatization of a new fodder plant, the K'rsa' Allah', or Ervum, which may be cultivated upon the most arid soils, and in spite of the most prolonged droughts.*

During one of my journeys through Algeria, in August and September, 1859, where I was sent for the purpose of studying the silkworm, the cochineal, and other subjects in agricultural zoology—at a time when everything was burnt up by a drought of several months, when the bullocks and horses were suffering from a great scarcity—I was shown a small leguminous plant, the seed of which was given to the cattle, enabling them to exist until the season when fresh grass should have grown. Having questioned the Arabs upon the subject, I learned that this plant was regarded as specially sent by Providence; without it, the cattle would die of hunger during the long droughts. They told me that they gave the seed both to horses and cattle, first crushing it a little, and assured me that it afforded double the nourishment obtained from barley, but that its price of the latter was proportionately less, since they paid from 24 to 25 francs the 100 kilog., when barley was at 20 francs. They added that the plant would grow in the most barren soils, sprout and fructify in spite of the most prolonged droughts, and that it was called by the Arabs K'rsa' Allah', because they believed it was given by God himself.

The information I received having awakened in me a lively interest, I began to think that a fodder plant which could brave long drought might be usefully cultivated in Europe, particularly in our meridional departments, such as Italy, Spain, Portugal, Greece, Turkey, &c., where droughts are very frequent. I then procured some seed, determining to try the experiment of acclimatizing it, and afterwards extending the culture of it to localities where it might render services similar to those in Africa.

My first trial was in the environs of Paris, and near Toulon. It was not altogether successful: but still I was enabled to preserve the species, and habituate it to our climate. It was not, however, till the time when the Emperor graciously conceded to me a portion of land upon his imperial farm at Vincennes, for the purpose of experimenting, that I was able to obtain each year better results. There, on a meagre, calcareous soil, upon an arid upland, and without using any manure, I succeeded in acclimatizing the Ervum, which yielded me every year increased produce. Now, after six years' trial

and complete success, I invite agriculturists who live in meagre, arid localities, to try the culture of the K'rsa' Allah'; that by that means they may be able to judge whether it is likely to render them services equal to those it gives to the Arabs.

If, as I hope, this leguminous plant takes a place in the agriculture of some localities in France, or elsewhere, it may perhaps be improved, so as to render the growth taller. It is even possible that if cultivated in good soils it may be made to yield as much, and even more, than oats. As soon as I found my acclimatization experiments begin to promise me the acquisition of the K'rsa' Allah', I wished to know to what species it belonged; and with a view to obtaining the necessary information, I sent a stalk to M. de Candolle, who informed me that it was the *Ervum ervilia* of Linnæus—variety *angustifolia*. It is a species suitable to Mediterranean regions, and holds its place near the lentil (*Ervum lens*). This year my crop—obtained from a surface of 160 square metres—is not yet thrashed; but it is very abundant, as the plants I had the honour of exhibiting before the committee of the Central Society of Agriculture showed. There are numbers of pods, filled with grain, upon each stalk; in fact, they are almost as numerous as the leaves upon the greater part of the plant.

I shall continue the culture of this plant under the same conditions, and think that others would be willing to make experiments with the species; I therefore offer, first to my fellow-members, the seed harvested at the commencement of this month (Aug. 6th), proceeding from seed sown on the 7th of May; and shall be glad also to place it at the disposal of any agriculturists who may wish to try its culture.

Should this acclimatization prove useful—if the K'rsa' Allah' or *ervilia* from the imperial farm of Vincennes spreads itself in dry and arid lands, rendering the same services that it does in Africa, my desires will be accomplished, for I shall have added one more proof of the benefit the imperial farms are to agriculture, by enabling seekers to try experiments when they could not otherwise obtain the means.

F. E. GUERIN MENESVILLE,  
Member of the Imperial and Central Society  
of Agriculture of France.

## PROFESSOR ANDERSON'S LECTURE.

## "THE CHEMISTRY OF WOOL, AND ITS MANAGEMENT."

After the dinner of the committee and judges, at the Highland and Agricultural Society, at Inverness, Professor Anderson delivered a lecture on the "Chemistry of Wool, and its Management." There was a large attendance.

Professor ANDERSON said: In addressing you on the present occasion in the centre of a district in which arable farming scarcely occupies that position of preponderating importance which it does in most places, I have endeavoured to select for your consideration a subject bearing more immediately on its staple produce; and the choice has not been unattended with difficulty, for the agricultural questions with which chemistry has been chiefly occupied are exactly those which bear most directly on the operations of tillage, and least so on those of the sheep farmer. The composition of the soil, and the manures to be applied to it, of the crops it yields, and the feeding stuffs which can be most advantageously employed for the fattening of stock, are the subjects which have come most prominently under the notice of the chemist; and though they necessarily embrace many matters which must greatly interest the sheep farmer, in common with everyone connected in any way with the practice of agriculture, they do so to a less extent than others bearing more directly on this particular subject. The great majority of the questions which are of most importance to him are of a kind on which chemistry is incapable of throwing light, and with which, indeed, it has no connection of any kind. Even here, however, there are matters on which a knowledge of some chemical facts is not unimportant, and among these I have chosen the chemistry of wool and its management as one likely to possess some interest on the present occasion; and though I may possibly touch upon matters which may at first sight appear to have no very direct application to practice, I am satisfied that further consideration will show that they are far from unimportant. For it cannot be doubted that those who feel an intelligent interest in their profession will seek to know everything connected with it, being well assured that there is no fact which may not at some time or other come to possess a direct practical bearing on it. The subject I have selected for consideration, taken in its broadest aspect, is one of great extent, and might, in fact, be made to include the entire management of the sheep; for the production of a good crop of wool of the highest quality involves the nicest attention to the breed of the animal and its perfect health. But these, and especially the former, are matters which do not come within the province of chemistry, and cannot, therefore, be discussed here. Neither is it always possible to explain by analysis the cause of the difference in quality of different kinds of wool, the commercial value of which is due not so much to its composition as to its structure. We shall see presently that there are often differences in the composition of the various kinds of wool, but on the other hand two samples may be chemically undistinguishable from one another, although the experienced wool stapler will set down one as of the highest, and the other of the lowest quality. Even the wool of a single fleece is separated by the manufacturer into many qualities fitted for different purposes, and bearing very different values. The cause of this is rendered obvious when the wool is examined by the microscope, when it is seen that its quality depends partly on the fineness and uniformity of the fibre, and partly on the length of the staple, which fits it for the manufacture of particular fabrics. It is well known that these qualities are greatly affected by the breed and the climate in which the sheep has lived, and it is by attention to the former that the character of Scotch wool has been so much raised; while the latter is a difficulty with which our sheep farmers will always have to contend, and which must prevent our wool in general from bringing as high a price as that produced in more favoured localities. The nature of the food supplied to the sheep has, no doubt, a material influence on the quality of the wool, and is a subject which well merits attention. But I do not propose to enter upon the consideration of this question on the present occa-

sion, and that principally because the information regarding it is of the most scanty description; and I have failed to discover any experiments on the influence of the food on the weight or quality of the fleece. We know generally that the best wool is obtained from animals fed on the richest pastures, but it is not possible to tell how far the superiority is due to the more nutritious character of the grasses, or merely to the more favourable climate. The composition and nutritive value of the cultivated and natural grasses of lowland districts are well known, but there is absolutely no information regarding those which form the bulk of mountain pastures. Many of the species are no doubt the same as those found in the lower districts, and their composition is probably very similar, though others are different, and of their composition we are entirely ignorant. There would, of course, be no difficulty in making analyses of these; but the information they would convey would be of little use, unless it were coupled with a knowledge of those which the sheep select and avoid. It is probable, indeed, that the higher or lower value of mountain pastures depend not so much on the difference in the nutritive value of the grasses of which they are composed, as in the greater or less abundance of those which are most palatable to the stock—for sheep prefer the finer grasses, and are only compelled by hunger to consume the coarser species, although they are often just as nutritive as those they select. The influence of an abundant supply of food on the quantity at least of the wool is sufficiently obvious, but it becomes still more striking when we consider what that quantity is, and how active must be the animal functions by which it is produced. To do this, it is necessary to look at the relative weights of the fleece, and the animal which produces it. These vary greatly with the breed, as may be seen from the table here given, which contains those which are most widely distributed in this country:—

LONGWOOLLED.	
Lincolnshire . . . . .	8 to 10 lbs.
Devon . . . . .	9
Leicester . . . . .	7
Blackfaced . . . . .	8
INTERMEDIATE.	
Dorset . . . . .	8
Cheviot . . . . .	5
SHORTWOOLLED.	
Merino . . . . .	8 to 8
Shropshire Down . . . . .	7
Southdown . . . . .	3 to 4

Taking all the breeds together, the average weight of a fleece may be set down at 6 lbs., while that of the sheep in the unfattened condition will not exceed 90 or 100 lbs. It thus appears that a sheep produces every year a quantity of wool equal to about a sixteenth of its own weight. Even this, however, does not give a perfect idea of the matter, which can only be obtained by making the comparison between the dry wool and the dry matter of the sheep. Wool in its natural state contains about 16 per cent. of water, and if an allowance be made for dirt adhering to it, the weight of actual wool in each fleece is about 5 lbs. But the entire body of the sheep contains about two-thirds of its weight of water, so that if dried up (exclusive of wool) it would weigh only 80 lbs.; and hence it follows that a sheep produces annually, in the shape of dry wool, a quantity of matter equal to about one-sixth of the solid substances contained in its body. These facts are sufficient to show the importance of an abundant supply of nutritive food to support the drain in the system occasioned by the growth of this large quantity of animal matter. When we further consider the delicate organisation of the skin, each hair of the wool growing within a little tube of its own, furnished with minute glands, by which it is furnished with a peculiar oily secretion necessary to promote its growth and keep it in a soft and pliant condition, and others by which the

perspiration is evolved, and that the growth of the wool depends upon all this complex machinery performing its functions in a perfectly healthy manner, the importance of an exact knowledge of all the conditions affecting them will be sufficiently obvious. Without venturing to discuss the physiological questions connected with the functions of the skin, I proceed to remark that the chemical composition of the wool is extremely complex. As removed from the animal, it consists of two parts—the wool proper, that is, the fibre which is used by the manufacturer; and the “yolk,” a peculiar substance secreted by the glands of the skin, by which the fibre is moistened and protected. In the process of scouring the wool, which is the first step in its manufacture, the greater part of the yolk is removed by means of water and other agents, the action of which will be afterwards explained, and the fibre obtained in a more or less pure state. By careful treatment, the scientific chemist removes them entirely, and then obtains the pure fibre, which then differs but little from the hair of other animals. We shall consider separately the nature of each of these. The pure wool is of itself a very complex substance. It contains a small quantity of fixed or mineral matters, which are left behind in the ash when it is burnt, and this contains a comparatively large quantity of silica, a substance found in extremely limited quantity in the animal body. Setting aside these substances, the wool consists of—

Carbon . . . . .	50.65
Hydrogen . . . . .	7.02
Nitrogen . . . . .	17.71
Sulphur . . . . .	2.31
Oxygen . . . . .	22.31
	<hr/> 100.00

In composition, therefore, it does not materially differ from the nitrogenous constituents of other parts of the animal body. It is as rich in nitrogen as the gelatine of the bones, and surpasses every other animal substance in the proportion of sulphur it contains. The state in which this sulphur exists in it is peculiar. A very distinguished French chemist, M. Chevreul, supposed that it might be removed from it without injuring the quality of the fibre; but more recent experiments have disproved this view. But they show that a portion can be easily extracted, although the remainder resists all agents, except those which completely destroy the fibre. So feebly is part of the sulphur retained, that it is actually expelled when the wool is boiled with water, and even slowly escapes at ordinary temperatures; and this is the reason why metallic, especially silver, articles become black on the surface when left for a long time in contact with it. A portion of the sulphur can be easily removed by alkalis, but a part resists their action, and from this difference in the condition in which it is present it is not improbable that the fibre of wool is composed of two different compounds, but chemists have not yet succeeded in devising a method by which they can be separated. This opinion derives support from the fact that the quantity of sulphur varies in different samples of wool, and appears to depend in some way on its quality. It has been found to vary from 3.4 per cent. down to 1.89, and one observer has even found as little as 0.89, although this result appears to be doubtful. The largest proportion (3.4 per cent.) was found in the wool of a particular breed which feeds on moorlands in Germany, and which is extremely coarse and inferior in quality, while the lowest was found a particularly fine wool. The quantity in ordinary wools is about 2.5 per cent., and from that to 2 per cent. was found in several samples of English wool, though the experimenter unfortunately omits to specify the breeds. The “yolk,” as it is called, which is mixed with the wool proper in the fleece, is still more complicated in its composition, and is a mixture of a variety of substances secreted by the oil and sweet glands of the skin. The proportion found in the fleece varies very greatly, sometimes amounting to nearly half the entire weight of the fleece, though in general it does not exceed 25 per cent. In one instance examined by Chevreul the wool contained only 31 per cent. of pure fibre, but the loss in this case included 26 per cent. of earthy matter adhering to the fleece; but even including dirt, the quantity rarely exceeds half the weight. It appears that the yolk is largest in the finer varieties of wool, but upon this point there appears to be considerable room for further inquiry. The chemical nature of the yolk was first examined in the end

of the last century by Vanquelin. Before his time it had usually been considered to be of a fatty nature, but he showed that it was principally composed of a soap containing potash as its base, some carbonate of potash, small quantities of some other salts of potash, and an animal matter. More recently Chevreul examined the yolk, and found it to contain, in addition to these substances, two peculiar substances of a fatty nature, but differing from ordinary fats in being incapable of forming soaps with the alkalis, but which have not been more particularly studied since his time. When wool is immersed in water, a portion of the yolk, consisting of the matters exuded by the glands, rapidly dissolves, and the matter so taken up is rich in potash, and has to some extent the qualities of soap. As this accumulates in the water it acquires a powerful detergent property, and causes the fatty matters of the wool, which are themselves insoluble in water, to enter into solution. In this way Chevreul found that 33 per cent. of the wool entered into solution, but it retained 84 per cent. of fat, which could only be extracted from it by spirits of wine or by alkalis. These substances are removed from the wool in the process of scouring, first by the use of water, and afterwards by means of an ammoniacal solution. Formerly urine allowed to putrefy until ammonia was produced in it was employed for this purpose; but the facility of obtaining the pure alkali has led to its being substituted, and in some cases soap is also used. The nature of the soluble matters of wool has undergone a further examination within the last few years by two Frenchmen, named Mamme and Rogelet, who have founded upon it an interesting branch of manufacture peculiarly worthy of the attention of the farmer, because it gives him some indication of what sheep are receiving from the soil. According to their observations, average wool, when washed with water, yields to it 15 per cent. of its weight of yolk, composed of a particular animal acid in union with potash, of which it contains about 33 per cent. According to this calculation, a fleece weighing 6 lbs. must contain about 5 ounces of potash which are for ever removed from the soil and have hitherto been entirely lost. M.M. Mamme and Rogelet, however, recover this, and their process is in actual operation in some of the great centres of the woollen manufactures of France, and is in all respects a most interesting and important one. They buy from the woollen manufacturers the yolk obtained in their process of washing, according to a carefully graduated scale, giving for that extracted from a ton of wool about 15s. if it be diffused through 69 gallons of water, and only 4s. 5d. if contained in 600 gallons, and at proportionate rates for intermediate degrees of concentration, the different prices paid for the same article in different degrees of dilution depending on the increased cost of recovering the potash from the more dilute fluids. By this means the manufacturers are induced to adopt a systematic mode of washing the wool so as to use the minimum amount of water. These fluids are then evaporated to dryness, and the residue introduced into iron retorts, where it is calcined, gas (which can be used for illuminating purposes) and ammonia being driven off, and the potash left behind in the form of carbonate. The quantity of potash which might be thus recovered from the wool is very large. M.M. Mamme and Rogelet state that there are 47,000,000 sheep in France, and from their wool, if it were all carefully washed, there would be obtained annually 11,700 tons of carbonate of potash, worth about £350,000, which is sufficient to supply the entire demand for that substance in that country. In Britain the figures are still higher. There are supposed to be 55,000,000 sheep in the United Kingdom, and in 1859 we imported the fleeces of about 22,000,000; and if the whole of this wool, both native and imported, were subjected to the process, it would yield upwards of 19,000 tons of carbonate of potash, worth £370,000. Of course it is not practicable to recover the whole of this, for a good deal of wool will always be washed on the small scale, when the potash cannot be profitably recovered, and the operation must therefore be restricted to the great manufacturing centres, where it can be carried on on a large scale, and in a continuous manner. The matter, however, is not on that account the less important to the farmer, for the rise of an industry of this kind brings forcibly before him the extent to which valuable substances are being removed from the soil. The wool produced in this country carries off annually 14,000 tons of carbonate of potash, equivalent to 9,500 tons of pure potash, all of which is at present entirely lost, and which it would cost nearly £200,000 to replace if the farmer bought it

in the market even in its cheapest form. It is to be remembered too that potash is the very substance of which, according to the modern system of manuring, we return the smallest quantity to the soil, so that if at any time our land should show symptoms of exhaustion, it will most probably be due to deficiency of potash. There seems no good reason why the farmer, though he cannot recover the potash in a pure state, should not wash wool in a systematic manner, and apply the fluid as a liquid manure to the soil. Although the yolk must be considered as a refuse matter, its presence has an important influence on the quality of the fleece. When it is deficient the wool becomes harsh, more or less brittle, and unfitted for the manufacture of the finer fabrics. A proper supply of it must therefore be of much importance, and can only be maintained by attending to the health of the animal; but unfortunately it is liable to be removed, and it is necessary to protect the animal as much as possible against its loss, or to produce some substitute for it. In those localities where much rain falls, the yolk, from its solubility, is liable to be washed out of the fleece, and the quality of the wool is thereby affected. In these districts it is customary to resort to the practice of smearing the sheep with various mixtures. This process is usually stated to be also employed for the purpose of protecting the sheep from the effects of cold and wet. For the former of these purposes I think it must be admitted that it can have no efficacy, for it seems impossible to conceive that the application of a small quantity of a greasy mixture to the skin can be of any use to an animal so well protected from cold. The real use of the smear is to destroy the tick and other parasites which infest the sheep, and by its oily nature to keep the wool in a soft condition. The mode of application of the regular old-fashioned smear was of the kind least suited to fulfil this object. The substance, always a greasy mixture, was rubbed into the skin in place of being applied to the wool. In practice, no doubt, what is applied to the skin gradually spreads itself through the wool; but in the meantime the thick oily coating is far from favourable to the proper performance of the functions of the skin, stepping up the pores, and preventing exhalation from them, while the substances mixed with the grease occasionally produce irritation of the skin. In fact, the application of such substances to the skin appears to be a violation of the laws of physiology, although their application to the wool itself might possibly be defended on the principle of keeping it in a soft and elastic condition, and preventing it acquiring a harsh and coarse texture—in fact, acting as an artificial yolk, when that is washed away by the rains. Of course this opinion goes on the assumption that the yolk really is washed out; but whether this happens, and to what extent, is a matter in regard to which there is no very definite information. I am inclined to think that the extent to which it occurs is over-rated, for it must be remembered that the wool in its natural condition repels moisture, and it is probable that water can penetrate it in sufficient quantity to affect the yolk only under exceptional circumstances. That this must be the case, I think, derives confirmation from the fact that the process of smearing is gradually disappearing, and is being more and more replaced by that of dipping, the object of which is merely to destroy parasites. It would be out of place to enter here into minute details regarding the composition of the various smears and dips in use in different districts, for they are really endless in number, but it may be useful to make a few general observations regarding them. They are either made up by the farmer from receipts which have been long in use and are well known, or they are manufactured by persons who make it their business. The oldest kind of smears were mixtures of grease, butter, palm oil, or other fatty matter with wood tar, or brown spirits of tar, and sometimes a little sulphur, resin, or soap. To these poisons were afterwards added to destroy the tick, those in most common use being arsenic, corrosive sublimate, and white hellebore. These materials were melted together and applied by separating the wool and rubbing the mixture well into the skin. Dips are mixtures of a similar kind, but generally containing a larger quantity of soap, in order to enable them to be mixed with the water. They consist in many cases of soft soap, tallow and oil, soda, and tar, which are well mixed together with the addition of some water, so as to give the whole a proper consistence, and the poisonous substance is stirred in while they are hot, or sometimes is added to the water in the first instance. Of course there are endless varieties in the nature of the mixture

and the mode in which the materials are combined, each of which claims some superiority. In general, the mixtures made by farmers themselves are of a simple character, but I have seen a receipt in which almost all the substances already mentioned were mixed together, somewhat on the same principle, I presume, as that on which unskilled physicians are said sometimes to mix together a variety of drugs in the hope that some one of those he uses may produce a beneficial effect. When the farmer makes up a dip for himself he may rest assured that the simpler it is the better. Very little good can be expected from the mixture of a variety of different oils or of several poisonous substances. In regard to the latter especially, too great care cannot be exercised, and the risk of accidents from poison being kept on the farm, and of carelessness on the part of those who use the dips, is one of the great objections to the practice of the farmer preparing for himself those poisonous mixtures. Several cases have come under my notice in which the disadvantage arising from poisons is well illustrated. I particularly remember a case of malicious poisoning of calves, which undoubtedly arose from the suspected person having got access to arsenic which was kept on the farm for making a dip. A large number of calves—seventeen or eighteen, so far as I now remember—died with all the symptoms of poisoning, and, on examination of the contents of the stomach, arsenic was easily detected in them. The animals had been fed on cooked linseed, and although none of it remained, I was able, by examining the pot in which it was boiled, to detect it there; and suspicion pointed to a particular farm servant who was known to harbour an ill-will towards his master; but the fact that arsenic was kept on the farm rendered it impossible to bring the thing home to him—for there was no means of proving that he had had access to it, and that the other farm servants had not. The fact of arsenic having been kept at the farm in this case defeated the ends of justice, and no doubt also formed the temptation to use it. The man would have hesitated long before he ventured to buy it, and had he done so the crime would have been brought home to him with unerring certainty. Accidents also occasionally occur from the careless use of poisons in the dips. This is well illustrated by what happens when arsenic is employed. That substance dissolves with great difficulty in water, and being sold in the form of a very coarse powder, part of which is in grains as large as those of sand, it falls rapidly to the bottom of the fluid, and can only be kept imperfectly in suspension by constant stirring. When this is not properly attended to, and the dip is nearly exhausted, it sometimes happens that the last sheep get far more than their due share of the poison. Particles of arsenic adhere to the skin and produce irritation, or being absorbed into the system affect the general health of the animal. Of course this illustrates the misuse of the poison, and it is against this that it is necessary to guard. As far as the destruction of the tick is concerned the action of these poisons leave nothing to be desired; the risk which attends their use is the sole difficulty, and that may be got over by the exercise of sufficient care. Notwithstanding this, accidents do occur, and hence a demand has arisen for non-poisonous sheep dips. Several of these have recently come into use, and they appear to be made chiefly from certain coal-tar products, oil and alkalis. In one, that portion of the coal-tar oil which is heavier than water is employed, and its action is attributed to its containing a substance called carbolic acid, which closely resembles the creosote extracted from wood tar. It is doubtful indeed whether they are not identical, and it is well known that a great deal of what is now sold as creosote is actually carbolic acid. The action of a smear or dip containing this part of coal tar cannot differ materially from that made in a similar manner from wood tar, and it is not easy to see wherein the superiority consists unless it be in economy of cost. The other dip is made from a portion of the coal tar which contains no carbolic acid, and it is stated to be equally efficacious in destroying the tick. The use of products from the distillation of bituminous substances for the manufacture of sheep smears is by no means new. It dates back a considerable period, a patent having been taken for the use of the oil obtained from bituminous shales (which contains carbolic acid) so long ago as 1770, although it does not very clearly appear how it was employed, and the substance probably never came into general use. It is only of late years that these substances have been again resorted to, and how far they have proved superior to mixtures containing wood tar I am unable to state.

It is not easy to form any opinion regarding the relative advantages of different dips or smears, but it may be stated generally that those made from the purest materials are to be preferred. Hitherto the great object of the manufacturer appears to have been to make them as nasty as possible, which may be very right when any virulent poison is mixed with them, because the sheep are thus prevented from licking it; but on the other hand, it is proportionally injurious to the wool. The fact is that the inferiority of laid wool depends to a great extent on the difficulty the wool scourer finds in removing the filthy matters contained in the smears; and what at the present moment is most required, especially in the case of a smear, is a mixture which shall not colour the wool and shall not be too easily removed by water, but can be completely extracted by the materials used in scouring it. In order to attain this object it seems most reasonable to use the purest materials which can be obtained, and as the chief disadvantages arise from the colour of the tar, there seems no good reason why carbolic acid itself should not be used. Of course, it is much dearer, but a comparatively small quantity would probably suffice. In the manufacture of dips and smears there appears still to be great scope for improvements; and the attention of manufacturers should be directed to devising some mixture which shall in a manner waterproof the wool, and shall yet be easily extracted from it without leaving any colour; and it is probable that this will sometime or other be accomplished. From the facts I have brought under your notice on the present occasion, it will be seen that there are many points besides the nature of soil, manures, &c., in which chemistry can assist the farmer; and I trust it will be found that some information and instruction may be derived from what has now been said. Whatever we may otherwise think, I imagine that no one can fail to see the advantage of looking at the same thing from different points of view, and examining both the sides which are proverbially to be found in every question.

The EARL of CAITHNESS said that he could not allow the party to separate without giving expression to the interest with which he had listened to the address which had been so clearly given by Dr. Anderson. He was not himself a sheep farmer, nor could he claim to possess an intimate knowledge of the subject; but coming from the extreme north of Scotland, where sheepfarming was so important, he felt very strongly the necessity for taking advantage of every improvement. He believed they were all too much inclined to go on in the old way, while they ought to be constantly making progress, and he was glad that Dr. Anderson had directed their attention to the question of the management of wool; for he was satisfied that in all that related to it there was abundant room for its

improvement, and he trusted the address they had just heard would be published.

Mr. GENTLES, Lochness-side, said that he could not agree with the conclusions to which Dr. Anderson had come with regard to smears and dips. He had never used anything but smears all his life, and always with success; while those who had used dips had always lost their wool. He considered dips of no earthly use, and in spite of all that science could say to the contrary, he meant to continue to use smears.

Mr. PATERSON, Birthwood, said that his experience was exactly the opposite of that of the gentleman who had just spoken. He had used both smears and dips, and he had never seen anything but unsatisfactory results from the former, while the latter had in his hands always succeeded. It was quite true that where dips were used the weight of the fleece was smaller than when it was smeared, but the greater value of the wool more than counterbalanced the diminution in quantity. He had always used arsenic in his dips; but he had taken care to mix it up well with the other materials, and had never seen any of the bad effects to which Dr. Anderson alluded. The great defect of all the substances applied to the wool was that they could not be removed satisfactorily by washing, and especially where tar was used it resisted all the efforts of the bleacher. He would like to ask Dr. Anderson whether gum might not be employed with advantage in making dips.

Dr. ANDERSON said there was an old saying as to who should decide when doctors disagreed? which had been often quoted to the disadvantage of science; but he thought that what they had just heard raised the far more difficult problem of who should decide when practical men disagreed? It was impossible for two persons to be more diametrically opposed to their views than the gentlemen who had just spoken; one upholding smears as keenly as the other condemned them. He thought that they might derive from this an instructive lesson, for it taught them that they must not dogmatise. Science and practice were in fact only two different modes of arriving at the truth, and when our knowledge was perfect we should be enabled to explain and reconcile the discrepancies which arose. Mr. Paterson had somewhat misapprehended what he (Dr. Anderson) had said regarding poisons. It was not their use, but their careless use, that he condemned. Arsenic, especially, was a most valuable substance, in consequence of the specific effect it produced on the skin, which made it the sheet anchor of the physician in treating all diseases. Mr. Paterson had obviously used it with care, and the result had been satisfactory. As regarded gum he did not think it could be used with advantage, because it was too soluble. What was wanted was some means of waterproofing the wool, as it were, and he thought that something of the kind would yet be devised.

## KEIGHLEY AGRICULTURAL SHOW.

The twenty-third annual show was held on Friday, Sept. 1. The Keighley show has always taken a position amongst the Yorkshire agricultural meetings. Amongst the visitors to the show-ground were, the Marquis of Hartington, M.P., Lord Frederick Cavendish, M.P., Lord Edward Cavendish, M.P., Sir Francis Crossley, M.P., Mr. Busfield Ferrand, M.P., Mr. Holden, M.P., Mr. W. E. Forster, M.P., Mr. G. Hardy, M.P., and Mr. Akroyd, M.P. About £500 was offered in prizes, including ten silver cups; and the entries exceeded one thousand, being a large increase on those of last year. There was an excellent display. The silver cup for the best three Shorthorns was taken by Mr. R. Eastwood, Thorneyholme, Clitheroe. Lady Pigott had entered for this and other prizes; but her Ladyship resolved not to send animals for competition, so long as the cattle plague prevails. Mr. Jonathan Peel obtained the prize for the best bull on the ground. The Short-horn cow of Mr. Eastwood's, "Brampton Butterfly" (second at the Lancashire show at Oldham), here proved superior to any other, and his "Rosette," which has obtained different awards at many places, was a good second. The silver cup for the best hunter was

taken by Mr. James Charnock, Halifax; and Mr. Brady Nicholson, Sturton Grange, obtained a similar prize for leaping. Mr. H. T. Percy, Howsarrigg, took the prize for roadsters, with his mare, which has for two years past taken the first prize at the Agricultural Hall, Islington. Mr. Percy also showed the best cob—an animal which gained a similar honour at Islington this year. There was an excellent show of draught horses, Mr. T. Walker taking the only prize. In sheep the silver cup was awarded to Mr. John Jowett, Prospect Villa, Keighley, as having the greatest number of first prizes. He was a head of Mr. Simpson, of Spofforth Park, the celebrated sheep breeder, by one prize. There was a numerous and choice collection of pigs; the best boar of the large breed, belonging to Mr. J. Dyson, Leeds, weighed no less 106 stones. The judges were—Shorthorns: Mr. John Patterson, Hall Beck, Ulverston; Mr. Henry Peacock, Haddockstones, Ripley. Horses: Mr. John McTurk, Acomb, York; Mr. Benj. Taylor, Ulleskelf. Sheep and Pigs: Mr. George King, Becca, Milford Junction; Mr. Wm. S. Robson, Great Oneburn, York. Goat Sheep: Mr. George Browne, Troutbeck, Windermere.

## INLAND RIVER IMPROVEMENTS.

In this article we propose confining our observations chiefly to the improvement of those rivers that flow in comparatively level valleys, leaving for our next and concluding article of the series the investigation of mountain streams. Practically speaking, therefore, our present example may be presumed to begin where our last one (No. II.) ended, viz., where the tide at high-water ceases to dam back and injuriously effect the drainage of the adjoining lands on both banks, and to end where our next article (No. IV.) begins. Our remarks, as in the preceding article, will chiefly be restricted to geometrical principles, or those considerations involved in the proper form and inclination of the channel of the river and its embankments. In other words the general progress of things imperatively demands a thorough reformation in our river policy, and we shall endeavour briefly to discuss the scientific principles involved in carrying out such a work of improvement.

The grand desideratum is to lower the surface-level of the water so as to afford a greater depth of fall for land-drainage, and to reduce the flow of the river to a uniform velocity, such as will keep the channel clear, without washing away the banks in high floods.

It is an easy matter to draw black strokes upon paper in any direction from a meridian, and at any angle with the horizon; but in the vast majority of our large valleys there are ninety and nine difficulties in the way of reducing fine theories to practice; and this is exactly the position in which we find ourselves when we begin practically to lower the surface-level of our large rivers and their tributaries in order to meet the loud, long, and lusty demands of the British farmer. You may as well, and much safer, meddle with a wasp's nest than with a miller's mill-dam and water-wheel; and yet, come when the crisis and final ultimatum may, the practical conclusion is meanwhile manifest enough to all who can read the signs of the times, for surface-levels must be lowered.

To find the depth to which the surface-level of the water at any point can be lowered by deepening and straightening the channel is, then, the first practical question for solution; and the second is of a kindred character, viz., the velocity that requires to be given to the stream, in order to avoid silting on the one hand and washing away the soil on the other. The two, as has practically been shown in the preceding article, are inseparably connected together, for the former is obtained by deducting the latter from the total fall of the river between the upper and lower points or extremes of the survey, or work.

The total fall of the river between the two extremes in question may be obtained by the common process of levelling, with levelling instruments. The angle of inclination which the surface of the ground or the river makes with the horizon, may be determined at any one point by means of an angular instrument, such as a theodolite, or some kind of draining level; but it is seldom that this does more than give an approximation as to what the angle of inclination of the new channel, or of the old when deepened, should in reality be at that same point, provided it is free from silting or washing away. The more advisable plan is to obtain the total fall and length of the river, as this will furnish the dimensions required for setting out the improvements with geometrical accuracy.

The total fall is sometimes easily obtained by what are termed "*natural water-levels*." If, for example, there are mills on the river or canal-locks uniting one part of the river with another, so as to make the whole navigable, then the sum of the falls at the mill, or at the canal sluices, will give the total falls sufficiently near, generally speaking, for the work of improvement. Sometimes, again, the water in the open ditches outside the embankments can be dammed, so as to find the fall, provided the water in the one dam falls directly into the water in the other, as the sum of the falls under such condition, would give the total fall.

Having obtained the total fall, and length as the crow flies, the next thing is to determine how much the bed of the river can be deepened in certain shallow places, and straightened at

crooked places, so as to reduce its actual length. If a single shallow, ford, or rapid can be deepened, and a bend of the channel taken off, it may greatly lower the surface level above these places, and thus facilitate the work of deeper drainage in the whole of the adjacent estates and farms on both sides farther up the river. Sometimes, again, narrow places, by confining the water, raises its surface, thereby damming it back above these narrow places. Less or more of this damming and tailing back process is experienced at bridges, jetties for shipping, and the like. The widening of the channel to its proper breadth would therefore lower the surface level above, and to the extent it had been abnormally raised by such obstructions. The reaction of the water at sharp bends of the channel and irregularities in the bottom also less or more retard the velocity of the current, thereby raising its surface to a higher level than were the channel straight and the bottom a uniform incline. A straight channel of smooth uniform dimensions, and fall, discharges more water in a given time than a crooked, rough, and shapeless one, and to many, perhaps to the majority of our readers, the difference is incredible.

There are numerous mill runs that very favourably illustrate this; for where the water enters upon the mill-wheel, it is not more than perhaps a foot in depth, often only a few inches, whereas above, where it is flowing in a comparatively level cut, the depth is often five or six feet, and of a greater width also than at the wheel. A deep channel also conveys more water than a shallow one, other things being equal.

Large rivers very frequently form the boundary marches or divisions between the landed estates of different proprietors; and when estates are entailed, or heavily mortgaged, such conditions often throw magnitudinous difficulties in the way of deepening them and straightening them, so as to improve the drainage and navigation. The vested and other interests of canal companies, bleaching works, and such like, also stand similarly in the way. But obstructions arising from these sources are often more the offspring of prejudice and imagination than well-founded reality; for if the contemplated improvements are properly effected, due respect being equally paid to the interests of all the parties concerned, then they would all be mutually gainers by its completion. Thus the landowners would have their estates better drained and somewhat increased in size, mills would have upon the whole a greater fall, while canal companies would have fewer locks and shorter distances to convey goods. But with regard to canals, they are now so fast being superseded by railways that it is almost too far in the afternoon to talk seriously of their existence, generally speaking; so that if the tidal channels of rivers are deepened, shortened, and otherwise improved for navigation, and the inland channel above the old high-tide level be also deepened, the general inland navigation would consequently be greatly improved, more especially that portion of it that can now enter successfully into competition with railways. The practical conclusion, therefore, in a public light, is manifestly in favour of the improvements proposed being immediately executed under statutory authority, where interested parties cannot agree amongst themselves.

In the straightening of small tributary streams and rivulets, the well-known practical rule of "take and give" often applies with so much accuracy that the land-surveyor experiences little or no difficulty in giving in a plan such as pleases the landowners and tenants on both sides; but it is often otherwise with large rivers. This difference arises partly from the greater magnitude of the latter work, but principally from the greater difficulty of straightening large rivers, from the peculiar position which they occupy in the valleys through which they flow, and the necessity which this enforces of adopting curved instead of right lines for new channels, where such are practicable.

But in many cases, if not the majority, new channels are impracticable, so that the work of improvement is confined to narrowing broad places, widening narrow parts, and deepening shallow fords, so as to bring the whole channel into a proper

form as to depth, width, and inclination—works which invariably call for the greatest circumspection, otherwise the upshot will be the reverse of improvement. Large bends here and there running round peninsular areas of land of considerable extent, where the two places of the river at the isthmus almost meet—and sometimes meet altogether in floods, thus forming islands—may be cut off, thereby straightening and shortening the channel. But in such cases the newly excavated materials are insufficient to fill up the old channel, or even make a sufficient embankment for the new one; hence the island thus formed may have to remain in possession of its present proprietor, and require a bridge to gain access to it.

A new cut through an isthmus or narrow neck of land, as above, is sure to increase the velocity of the river through it, and therefore suitable provision requires to be made to protect its banks above and also the head of the channel immediately below it, otherwise land will be washed away in both cases, thereby endangering the adjoining fields in heavy floods when the river is much swollen and its velocity and force greatly increased.

From the increased force and undermining action of swollen river-flood—the surface level being up to the top of the embankment and often “tipping over”—the connecting new channel through the isthmus should be curved and not straight, and the concave slope, both of the channel and embankment, should be opposed to the downward current of the river, and also have a greater inclination and altitude than that of any straight portion of it. The convex slope may, on the contrary, be made at a somewhat more steep inclination upwards, there being less pressure upon it. At the same time, although this is sound in theory, and often commendable in practice, in order to avoid silting, yet the more advisable course in the vast majority of examples is to make the convex slope of as great a length as circumstances relative to curvature will permit, so as to avoid silting; for when silting on the convex slope takes place, acute elbows are formed, with all the tailing back above, and injurious consequences below, that never fail to follow the existence of acute elbows during heavy floods.

In examples where the channel of the river above such new cuts through narrow necks of land can be lowered so as to reduce the velocity of the river to that which it had in the old channel, the danger to which such new cut and the bends of the channel below are liable will also be reduced, and when such is practicable no time should be lost in getting the upper surface levels of the current lowered, so as to reduce its velocity and power of doing harm in times of long-continued much-swollen floods.

To those who have not had their attention experimentally turned to the subject, the undermining effect upon the banks and embankments, which a very small increase in the altitude of the surface level of a swollen river produces, is almost incredible. To avoid repetition, the practical details of this part of our subject will be more fully gone into under “Mountain Rivers.” Meanwhile we shall only observe that we have personally known an increase of twelve inches sweep away everything before it, in a manner which language cannot describe so as to be practically understood. Now, as lowering the surface level of the river twelve inches in one part is tantamount to raising the surface level above that part twelve inches, the practical conclusion as to the consequences need not be drawn, as it must inevitably wash away soil, and in all probability, if the swollen flood continues for any length of time, break through the embankments also, and thus form a new channel adapted to its altered circumstances, as the laws of Nature or forces involved may determine.

If nothing is done artificially to deepen the bed of the river above the new cut that shortens the channel, the increase of velocity of the currents, and scooping effect of the same, will eventually perform the work of deepening, provided the bottom soil is similar to the staple. In such cases, the natural process of deepening requires to be closely watched by the adjoining proprietors, otherwise injury to the slopes of the channel and embankment will be the upshot during the first heavy flood. Harm may even be produced by the river in its ordinary state; so that the protection of the banks at the bottom of each incline, or that part of the channel exposed to the scooping action of the water, may require artificial interference immediately.

The “*Take it easy*” method of leaving flowing water to take care of itself, under circumstances of the kind in question—a rule too commonly followed—is a highly reprehensible practice, being the very reverse of that which ought to be pursued. If the channel is straight, the risk will be reduced to a minimum, because the natural tendency is a right line with the greatest depth of current, and, consequently, scooping action in the middle of the channel. But, in practice, straight channels are the exception, and crooked ones the rule; and, under such conditions, the greater depth and scooping action of the flowing stream will be either towards the one side or the other—generally towards the concave bank—unless natural or artificial means interpose, so as to deflect the current into a different course. The true plan in all such cases is for art to assist nature in the work of deepening the channel in the middle.

GEOMETRICAL.

## ON THE IMPORTANCE OF ECONOMY IN THE PRACTICE OF AGRICULTURE.

At a meeting of the Croydon Farmers' Club, Mr. E. STABLES, of Ficklehole, said: Mr. Chairman and gentlemen, our subject is “The importance of economy in the practice of agriculture.” The wise man says, “to everything there is a season, and a time to every purpose under heaven.” Now, it certainly is not the time to talk over the profits of the past three years, but it will readily be allowed that it is the proper time to inquire how are the profits to be obtained? And if so, the economy of production must form a very important part of the general question. But, before we inquire as to the importance of economy, the question naturally arises, What is economy? What does it consist of? Perhaps that question can be best answered by first referring to what is not economy. In the first place, then, we will state without fear of contradiction, that bad farming is not economy; and, in the next place, we will assert with equal boldness that a too limited use of manures is not economy. I am convinced that the generality of the farmers of the present day make a grand mistake here. After having incurred all the fixed charges against the crop, such as rent, taxes, labour, and all the sundries which cannot be avoided, how common it is to see only half a crop, solely for want of a moderate outlay in some suitable manures. I would ask is it economy to spend £5 an acre for half a crop, or £8 per acre for a full crop? It is not economy to over-

work or underkeep, or in any wise neglect the farm horses. An insufficiency of nourishing food to the live stock generally is not economy. It is a common mistake to allow an animal about sufficient food to enable him just to maintain his condition; whereas a little more—only a little more—would enable him to improve and leave a profit, often to double his value in the course of six months. It is not economy to allow an animal a sufficiency of food, and not also to provide him suitable lodgings, and a good bed, and also to see to it that he is kindly treated; that he is in circumstances, and surrounded by circumstances, in which he can be happy and contented; if he is in constant fear he cannot thrive. My own experience is, that it requires one-third more food to keep up the animal heat when exposed in a cold yard, than when suitably and comfortably housed. I believe that if farmers generally knew how much they annually lose for want of suitable shelter for the animals and their manure, the landlords would hear more about it. What we want in a farmstead is such buildings as will enable us to make the best of the stock and crop, otherwise we cannot farm with economy and profit. It is not economy to allow either animals or implements to get out of repair. How true is it that “a stitch in time saves nine!” “For want of a nail the shoe was lost; for want of a shoe the horse was lost; for want of a horse the rider was lost.” How many



a good horse has been ruined for want of a little timely rest and medicine! It is not economy to allow the land to get out of cultivation; one year's seeding will cause seven years' weeding. A farm may soon be run out of condition, but it takes a series of years of expensive and unprofitable cultivation to get it into a profitable state again. Whatever may be the seasons or markets, profits and losses to one and all, I would say, if it be possible, keep your cultivation up to the mark. Unfavourable seasons require additional outlay, both in the cultivation and in the application of manures; whereas it is a common practice (especially if we have, as we lately have had, low prices in conjunction with unfavourable seasons) to let the land out of condition. It is suicidal policy. Not only does it cost much more to get it into condition again than what was saved by running it a little, but when good seasons and better markets come where are you? Why busy enough getting your land into cultivation, which you will accomplish in time for another wet season and low prices. But whilst true economy does not consist in unduly reducing the outgoings of the farm, nor in producing middling crops at a small expense, but in producing the largest results at a moderate cost, I am convinced there is often much lost for want of a due attention to the minutiae of the expenditure. The aggregate expenditure is made up of various items, and if the various items were examined one by one, it would be easy to prove that on some farms from twenty-five to fifty per cent. of the expenditure is wasted, especially on farms occupied by gentlemen who have spent the early part of their lives in the commercial world, and have realised a fortune, and naturally enough think they would like to farm; and because they don't know much about it themselves, rely upon the bailiff; and what is the consequence? True, they generally succeed in growing respectable crops; but what about the expenditure? It may be quite as healthy as they expected; but where are the large profits they prospectively boasted of? A good education is of great importance to the farmer. He should know almost everything. He should understand the scientific and theoretical part of his business; but woe unto him if he is not thoroughly up in the practical part. In the simple operation of ploughing the land, I have often seen a man and a boy and four horses, using an antediluvian plough, doing about two and three-quarter rows per day. Reckoning each horse at 3s. 6d., the man at 2s. 3d., and the boy at 1s. 6d., this costs 25s. per acre; when over the hedge, on similar land, you might see a modern plough worked by one man and three horses abreast, doing an acre per day with ease, making quite as good or better work than the other, and, reckoning the horses and man at the same rate, at an expense of 12s. 6d. per acre, being a difference of £50 per cent. in the expense of the operation. And if you look out at seed time, you will probably see, if the seed is sown broadcast, one man pretending to sow with one hand, and getting over about six acres per day. In the other, you will probably see a man using both hands, and doing twelve acres a day, and making better work; nay, I have even seen two men, one boy, and two horses, using a drill, with coulters jacked up, putting the seed on broadcast, costing two shillings per acre, where the work might have been equally well done for 3d. per acre. Don't understand me to recommend broadcast sowing; I would always drill when the land is in a proper state. Then, again, in the operation of harrowing; in the one case the old-fashioned wooden harrows will be drawn over the ground three or four times; and in the other case twice over with a modern implement will make quite as good work, and much better if you don't want the land treading; and if you follow out the various operations on the two fields until you get the corn into the market, reaping in the one case with the sickle, and in the other with the reaping machine—thrashing in the one case with the most primitive of machines, and in the other with the steam engine—you will find a difference in the expense of about 50 per cent. throughout. The importance of economy is strikingly evinced in the different modes of working the fallows. The old system—that of working exclusively with the plough and harrows—is very expensive. In this way, four or five ploughings and harrowings, and rollings out of count, is necessary to make a respectable fallow. True it has been well exposed to the atmospheric influences, and in that way has been much benefited; but it is very doubtful whether the couch grass and other weeds have been destroyed, unless the weather has been very dry and hot. There has not been time

for the couch, and especially the knot-grass, to die before it must be ploughed in again, and with such frequent ploughings the soil is generally in a rough state, and unfavourable to the germination of the seeds of weeds. Of course it is a very important part of the fallowing operation to cause the seeds of weeds to germinate, which is certain destruction to them. It is also important to bear in mind that there is a class of weeds, such as the dock, which cannot grow without the crown. In this case a shallow broadsharpening in the autumn is far more effective than several deep ploughings in the following summer. If you take off the top of the root with the broadshare, and keep it on the surface of the ground, occasionally moving it with the harrow until it is dead, there is no need to trouble about the bottom part of the root: it will never grow without the crown; but the crown will grow if it be in the ground at all with ever so little root to it. Some of our modern farmers disband the turnover plough altogether, using the cultivator exclusively in the working of the fallows; and certainly it is a much better and a much cheaper mode than the old fashion of ploughing and harrowing. But my opinion is that a medium between the two extremes is much the best, and quite as cheap as working exclusively with the cultivator. I prefer to put the cultivator two or three times through, with intervening harrowing, until the couch, &c., is worked out and kept at the top sufficiently long to ensure its destruction; and also of having the surface so perfectly pulverised as to ensure the growth and destruction of all the seeds of weeds, after which I want to see the other side of the soil, when some more couch, previously unseen, and another crop of annual weeds is sure to be the result of fresh soil brought up. The practice of some farmers is always to plough the land one stereotyped depth. Now I hold there is great economy in varying the depth—once in a course of cropping. When it is fallow, I prefer to have it thoroughly bottomed; then, cost what it may, I want it ploughed as deep as it will can be ploughed. The leys and general seed furrow I plough a moderate depth; but after the sheep I prefer either to plough very thin, or, if the field is not so clean as desirable, I use the cultivator instead of the plough. I consider that ploughing various depths is not only a great saving of actual and direct expenditure—four inches deep not taking near half the power of eight inches in depth—but is also most economical, inasmuch as the evils of the old beaten, almost waterproof bottom is avoided. The importance of autumn cultivation, in an economical point of view, cannot well be overestimated. It is a well-known fact that couch-grass and other weeds do not make much progress so long as there is a good crop of corn on the ground; but let the corn crop be removed, the rubbish will at once begin to grow and prosper. One class of weeds will then be taking firm root hold; another will be ripening and maturing its seeds ready for a future crop; and if you allow the weeds undisturbed possession of the ground for about six weeks after harvest, then plough the ground a nice depth, the couch roots will be preserved in good health, and the seeds of weeds, then fully matured, will remain in a dormant state for months or years, as the case may be, until they are turned up again, when, if the land is in good health, a luxuriant crop or crops is sure to be the result. But why allow this if we are to farm with economy and profit? These weeds must be destroyed, and the sooner after the harvest the better. The cultivator must be used, the couch-grass and the roots pulled out to the surface, and the surface so pulverised as to compel the seeds of weeds to germinate. If this is done, no matter how much rubbish, if it is fairly got to the top and shoot out, and left to bleach until the winter, it may then be quite safely ploughed in; it will cause no more trouble. It will certainly decay in the ground, especially if it is buried a good depth. It is not easy to estimate the importance of this in an economical point of view. The difference in the expense between cleaning the land in this way, and of allowing the weeds to increase, greatly impoverishes the land, whereas it derives great benefit from atmospheric influences in the process of these autumn fallows. The economical farmer will also be careful to apply the proper kind of manure to his various crops, and he will also be careful to apply them at the right time. A great deal more effect is produced from manures thus applied than when improperly applied. It requires good judgment and some experience to know when the application of artificial manures is likely to pay. It is folly to expend money in manure, if the crop has other difficulties to contend with—if the land is in a rough, unkind state—if it is foul with weeds—or if it is wet for want of

draining; but if it is clean, if a good tilth has been obtained by using the cultivator freely, and other circumstances are favourable, a judicious outlay in manures will almost invariably leave a large profit upon the outlay—I say a judicious outlay. The different kinds of crops require different nourishment, just as the different kinds of animals require different kinds of food suited to their constitution, and supplied at the proper time, *i. e.*, frequently. I don't believe in a heavy dressing of manure once in two or three years, any more than I believe in supplying an animal with food to last him two or three weeks. The animal will not only waste his food, but he will not thrive at all; he will be glutted one day and famished the next. I would not only supply this land with nourishment every year, but two or three times a year where it is practicable. It is sound philosophy not only to get the land into good heart, but to keep it in good heart. As a matter of economy the proper direction and supervision of the farm labourer is of importance. It is like a complicated machine, wheels within wheels, and if it is not properly constructed and directed breakage and loss is the result. I am convinced that a difference of more than 25 per cent. is often made in the amount expended in labour, attributable entirely to the general direction. Instance the difference in the manner in which the dung-carrying is done. In one case the cart loads his own cart, then goes along with the cart to its destination and unloads it, perhaps in small heaps on the land—the spreading to be another operation; the consequence is that the horses are about half their time waiting for the man, and the man about half his time waiting for the horses. In another case you may see three men loading the cart, and one horse in the cart. Just as the cart is loaded, a boy with an empty cart and two horses makes his appearance. He transfers his trace-horse to the loaded cart, and away it goes. There will be other boys to drive, and trace-horses according to the distance the manure has to go. At the other end will be two men spreading the manure out of the cart direct to the land, which they will be able to do just fast enough to keep the fillers at work. Thus there will be a steady stream of manure going out, and nobody waiting, and nobody overworked. Of course the same remarks apply to all carrying operations. There is great economy in paying the men by the piece instead of by the day, whenever it can be done. Not only is the work done cheaper, but it is more just to the men. If one man, in consequence of more strength or skill, can earn more than another, he ought to be paid for his strength and skill. In common justice to ourselves we are bound to pay for work done, and not simply for time spent. We are bound to encourage skilled labour in every way we can, for we are becoming more and more dependent on it; and if the farmer is not sufficiently master of his business to be able to estimate the value of the different kinds of work done, and to let it to his men at a fair price, he must suffer the consequence of his want of skill. If a tradesman or a professional man is not skilled in his business what is the consequence? Why, he has to go to the wall. So it must be with the farmer. It is said that there are secrets in all trades, and if the farmer does not know the secrets of his own profession we betide him. Knowledge is power, but practice makes perfect; and it is only by diligent, intelligent attention to the practical part that the farmer can qualify himself for the successful prosecution of his business. See how carefully and expensively the professional man is educated and trained for his profession; but when he is fairly aloft in the world what can he do without practical skill or good abilities in full practice? An important lesson may be learnt from the commercial and manufacturing world. If you walk round a large manufacturing you will not fail to observe what careful attention is given to the very minutiae of economy. The very existence of the manufacturing depends upon this. A difference of one per cent. in the expense of the productions of the manufactured article would often be fatal to its success. The large fortunes that have been realized by some of the manufacturers is, as a general rule, the result of small (often very small) profits upon a large trade. Such is the severe competition amongst them that all and every of the essentials of capital and skill, all the modern discoveries of machinery and chemistry, with the most rigid economy, is brought to bear, or success is hopeless. Although his profits are now much smaller upon each manufactured article than formerly, yet, in consequence of a much larger production, by means of modern appliances, his income does not suffer, but otherwise. Is it not even so with the

farmer? He is engaged in a severe competition with the whole world, and, so long as the malt-tax is on, a very unfair competition. He requires all modern appliances with skill and industry, and he can make two blades of grass grow where one grew before. He can grow two quarters of corn where one grew before. And if so with ordinary seasons and ordinary markets, shall we despair of success? By no means. But another very important lesson may be learnt from the manufacturer. You will always find him paying most attention to, and producing most of that particular article for which there is most demand, and on which there is most profit. You will always find him quickly adapting himself to the wants of the times. He will not bestow his capital and skill upon an article for which there is no longer a good demand. The price of wheat has gradually declined until it is now 40 per cent. cheaper than it was a few years ago. The price of butcher's meat has gradually increased until it has become nearly double what it was 15 years ago; and this is not an accidental state of things. It is the natural effect of certain causes which will continue to operate in perpetuity. Then it is quite evident that if the farmer would succeed he must not follow the old routine. He must not do so-and-so because his father and his grandfather did so before him. Of course he must continue to grow corn, and the more the merrier; but it must be done on a restricted number of acres, so as to leave an increased area for the production of a much increased quantity of summer and winter green crops. Our corn crops must be the natural result of the green crops, and of the heavy live stock kept to consume those green crops. The production of butcher's meat must be our primary object, to which we must look for our chief profit, and the growth of corn a secondary object. There are several other points of rural economy upon which I should like to have touched, such as the importance of labour-saving machines, of providing, but especially of preparing, suitable food for the various kinds of stock, of doing the right thing at the right time, of attending to the practice of economy in the commercial transactions of the farm, of buying in the cheapest and selling in the dearest market, &c. I will conclude by reminding you that economy is not frugality or parsimony, but the economist is described in the dictionary as one who manages his affairs well. Gentlemen, I thank you for your patient attention, and I hope where I have misapprehended the subject, you will set me right, and that we shall have a good discussion.

Dr. SHORTHOUSE said every one present must say that the subject given by Mr. Stables was a most excellent one. It was the best that he had ever heard. It was certainly manifest to all that growing of corn would not pay. He then referred to the new assessment, and said the rateable area had been increased, and he also referred to the lavish expenditure of money in the county, saying, let them bring their interest to bear, and say to the magistrates, "Now your area is increased one-half, instead of your having a rate at 1d. in the £, let us have it at a halfpenny." The subject, he was glad to see, was going to be brought forward at one of the clubs. He had never seen such lavish expenditure of public money as there was in the county of Surrey. They had idiotic asylums, goals, and palaces, and they were splendid palaces, which they were called upon to support, and economy was therefore necessary. He would just say something about sheltering of sheep. Mr. Mechi had said that temporary shelter for sheep could be had for 1s. 3d. per week. In keeping sheep under shelter in cold weather they would not lose that quantity of fat as if they were kept out in the dripping wet and cold, their fat being consumed in keeping up the heat of the body.

Mr. WALKER thought that economy in starving stock or land was no economy at all, and he must give Mr. Stables credit for the subject he had given them.

Mr. SMITH said although he was not a farmer, he must say that the subject introduced by Mr. Stables was a deeply interesting one. It was notorious that England was a receiver of raw produce, which she manufactured, and by manufacturing the raw produce she received she grew rich. He thought the more that live stock was attended to, the better it would be for England. It had been said that although the British farmer could produce the ox, he could not produce the poultry; but he must say that when looking round Lendenhall market he saw very good poultry there. They could not get so much out of poultry as they could out of stock, but he thought poultry was worth a farmer's consideration. He could not help it if his

granddaughter preferred sitting in the parlour and playing the piano instead of taking an interest in what was in the yards. In conclusion he hoped they would not neglect the poultry for the ox. It had given him much pleasure in listening to the subject Mr. Stables had favoured them with.

Mr. WALTON wanted to know a little about the scarifier. A great deal had been said about it, but his men did not care to use it. He had got a scarifier in his yard, and he wanted to know how to get it from there. Was he to plough first, and then cut his sods into pieces, and must he then put in his scarifier, and if he could not move it then with six horses must be put on twelve? He must say that this scarifier had completely scarified him. He had a lot of sheep, and he fed them with oil-cake and other food, but he had no turnips for them. If he said to his man, "How do the sheep get on?" he would say, "O, pretty well, but they want turnips." Turnips, turnips, was all he heard of; but he wanted to know how to get them. Now about the shelter of sheep. To put sheep in a yard and carry their food to them, and then to have to carry away their dung—he did not consider that would be economy.

Dr. SHORTHOUSE said it was temporary shelter he meant. They could get asphalted very cheap, and it would last 20 years.

Mr. WALTON was sorry to say that it would not. The question was whether it would pay to keep sheep in their yard, and then carry their dung out on their turnip land. Was it economy to put in rye and tares for the sake of getting the sheep's dressing? Perhaps he would tell them when green summer crops could be grown with advantage.

Mr. WOOD said he was going to answer with regard to feeding sheep under sheds so as to have their dung carried out. He did not know the number of the *Farmer's Magazine*, but in one of the numbers of that periodical, which should have a place in every farmer's library, there was a most excellent paper which had been read at the London Farmers' Club, and it was there stated that it had been carried out with advantage. He must say that the subject they had that evening listened to was a most excellent one, and he was much obliged to Mr. Stables for it.

Mr. BROWN said they had got to thank Mr. Stables very much for even putting them in mind of economy. It was good for them to be put in mind of economy. As they had been going on, they had every reason to act with economy. With the price of wheat as it was now, they would find that after they had paid for the labour and all other necessary expenses, they had very little left as profit. In the way of sheep, where the land was sticky, if they were to put them in a temporary place at night only, they would be able to lie down and sleep with comfort; otherwise, if they were left out they would lie down with trembling. He did not approve of making all their dung with sheep; that he did not think would answer. With regard to horned stock, many had not got covering for them, and when they saw them in the yard they must know that they were going back. With regard to the sale of stock, they must not expect to get high prices, but still, as Mr. Stables had said, he hoped they would get better prices than they were at present getting.

Mr. WALKER was not opposed to occasional shelter for sheep, and also having a good lambing shed. He thought there was nothing like sheep for land. They not only trod in their dung, but there was also their urine, which was of some value to the land, and he thought that, when practicable, they should have sheep for the land. With regard to stock—and he was now speaking of his own experience—he knew that stock got fat in warm places, and they got fat with half the quantity of food. If they kept stock in cold places it would take all the food they gave them to keep them, but they would not get fat. With regard to green crops—if Mr. Walton wanted to sow rye and tares, the best time to sow them was in the month of September; but he did not think a good farmer would grow much of that stuff. He (Mr. Walker) did not recommend this at all. What he would say in reference to this was, get out the tares as soon as possible, and thus get your land as clean as possible. To sow rye and tares he would say the best time would be September or the beginning of October; but he would not advise his doing so at all. He never did it himself. With regard to swedes, he thought they ought to be in by May; he intended to have his in by that time. He had grown tares, but he grew them for horses on corn stubble.

Mr. WALTON said he had put out the question because he had tried rye and tares, and he had a notion that they were valuable. He had tried a piece of land to get it into heart by rye and tares, and in the year 1862 he grew four quarters of wheat to the acre. After that he thought he would have wheat again, and he sowed tares, and as the tares came off he sowed winter turnips. The whole came off in time for him to put in wheat on the 25th or 26th of September, and it was now the finest piece of land he had. By the time they met again he should be able to tell them whether it was a success or not.

Mr. WILSON thought they were diverging from the subject for that evening's discussion. Having referred to the practice of economy, he said it was not economy to starve their horses, neither was it economy to pay their labourers 10s. a week, which, he was sorry to say, was the case in their neighbourhood. Referring to the number of horses he kept on his farm, he said that some had told him that two horses would do the same amount of work as four. Now, what was he to do, a cockney farmer like himself?

A VOICE: Try both.

Mr. WILSON went on to say that he saw many old farmers in the county still patronise the four-horse round plough, but his men did not like it. He formerly kept five horses on his farm, but he had come to the determination of only keeping four. He should like to know if that would be economy? He had wished to do without a boy in ploughing, but he had been told that with a turnwrest plough it could not be done. With sheep, he quite agreed with Mr. Walker, that their proper place was on the land. During the late hard frost he had his sheep fed on swedes in the yard, but he must say that he should not like to cart away all their dung on to the land.

Mr. HUMPIDGE said they were very much indebted to Mr. Stables for the subject he had favoured them with that evening. It was a subject brought forward for discussion, but he must say that they had not had any discussion on it. They had diverged from the subject of economy, and gone on a subject relating to the land. Mr. Stables had advocated deep ploughing. He should like to know whether it would be advisable to do so on a chalky soil, and where there was not much soil over the chalk, and whether it would be desirable to do so on such soils as so as to bring up the chalk. He (Mr. Humpidge) was an advocate for deep ploughing, and he was ploughing pretty deep now on a chalky soil, but he should like to know if it would be desirable to bring up that chalk. With regard to the keeping of three horses, where the work was said to be rather too much for two, he had tried the experiment, and he had found it to answer most admirably. Mr. Wilson had said that he had come to the conclusion of keeping four horses where he used to keep five. He should say to him keep three only, for two might be made to do the work generally. Now, with regard to the manure, Mr. Stables had said he kept two men spreading the dung. It had always occurred to him that it was a hindrance to throw it from the cart. He had thought it would be better for a man to follow and spread the dung after it had been taken from the cart. With regard to education, he thought a farmer could not be too well educated. They had a great deal to learn, but they could not learn too much. There was a gentleman present who was a stranger to the members of the club, but he hoped he would not be so long. He had made some remarks with regard to the keeping of poultry. He (Mr. Humpidge) would say that they picked up a great deal of corn that would otherwise be lost and wasted. He must certainly say that chickens thrived remarkably well. He once heard of a housewife saving £300 from the poultry, and when her husband wanted it she gave it to him. Such a sum from such a source would be very useful in these hard times. He would not advocate deep ploughing on all occasions. With regard to the shelter of sheep, he should say that it would be a very difficult thing to do so for a permanency. [Dr. SHORTHOUSE: It was not for a permanency; it was only temporary.] He thought cattle could be kept with more advantage than sheep. When sheep were kept on hot dung they were liable to get the foot-rot. The foot of the sheep grew very fast, and when they were kept on hot dung they got the foot-rot. With regard to rye and tares, he did not think it would pay to sow them where the land was clean. He thought they could more advantageously sow stable turnips for spring, and he had known them grown with advantage. He must thank

Mr. Stables for the subject he had given them that evening, and which he must say was most excellent.

The CHAIRMAN said his duty that evening was an exceedingly easy one. All he had to do was to reciprocate the opinion of others. He did not think that they had had such a subject for some years. He did not say that in any way to seek to disparage what had been done before. Having referred to the number of papers they required during the year, and that the vitality of that club depended upon them, he went on to say that he agreed with Mr. Walker that it was most practicable to have the sheep upon the land. They had had a paper some time ago read entitled "Stock v. Corn;" but Mr. Stables, with his paper, had gone a great deal further with the subject than it was on the occasion to which he had alluded. He quite agreed with Mr. Stables in not wishing them to grow more corn, but to grow more of green crops. They should grow more corn on a less area, and more green crops on a less number of acres. Mr. Stables had chosen his subject most suitably to the times, as the present was a time to act with economy. They would find that economy was practised in the counting-house, and in every manufacturing economy was most carefully practised. He was quite sure that economy on the part of the farmer was most essential. From the time he got up in the morning he began to give directions where such horses should go, and where certain men should go. His economy began thus early in the morning, and continued up to the time of his going to bed.

Mr. STABLES said, with regard to the scarifier, he would just make one remark. Mr. Walton had the same difficulty as many others had to contend with, namely, the men wanted to be the masters. He would recommend them to do this:—Ask

who was master, he or they. His men had one alternative, either to obey his order or go about their business. He could not see how sheep were to be housed temporarily. Sheep, in his opinion, did not want housing. They had a fleece of wool sufficient to protect them from the cold. With regard to what Mr. Walton had said, he held that nothing could be done unless the land was clean. He had asked what was the time to put in his rye and tares. He would say to him, get the land quite clean first, for if the land was not clean he would not have the tares. Mr. Brown had a little misapplied what he had said about better times coming. He did not think that he said anything about their getting high prices. With regard to what Mr. Wilson had said about ploughing with three horses, he thought that the work done by a turnip plough more than compensated for the extra horse. With reference to spreading dung as quick from the cart, he thought a man would spread it just as quickly from the cart as he would from a heap.

Mr. HUMPHREY said there was a difference.

Mr. STABLES said there might be, but it was a very little difference.

Mr. HALL (to Mr. Stables)—You said about having two men to spread the dung from the cart. How much would two men spread in a day?

Mr. STABLES said that was a very difficult question to answer. He (Mr. Stables) would make one remark about the poultry. There was a good price got for their poultry and eggs, and poultry manure was very good, and more than compensated for their trouble of keeping. He had his fowl house cleaned out every day, and the floor spread with ashes, and they made a great deal of manure in the course of a year.

A vote of thanks to Mr. Stables brought the meeting to a close.

## THE HEALTH OF CATTLE AS AFFECTED BY THE DIFFERENT SYSTEMS OF LIQUID MANURING.

The agricultural public lie under many obligations to the medical profession for the assistance afforded every now and then relative to the health of cattle; and at the present time we have to thank Dr. Cobbold and others for their invaluable researches in Helminthology. There is no one fact in natural history that has been more satisfactorily determined both from experiment and observation than the liability of cattle to be affected with intestinal and other worms, when fed on certain kinds of food, or feeding-materials of a certain quality; and the deteriorating consequences that follow sheep-rot or flukes in the liver may be quoted as one of the most familiar examples—one, too, that is applicable to ourselves as well as to our domestic animals. There are, however, many other examples whose historical and physiological details are not so well understood even as sheep-rot itself, little as we know about it, but upon which the above and other medical writers are at the present time throwing much fresh light; so that there is reason to hope that the general body of farmers will soon become sufficiently acquainted with the subject so as to be able to prevent the growth of these parasitical pests, and thus preserve their live-stock in a more profitable state of health than is at present experienced.

The question which we purpose discussing in this paper is the effect produced on the health of cattle when fed upon the produce of different systems of liquid manuring, including the old system of irrigation or water-meadows, sheep folding, the application of town-sewage to land, together with the liquid-manure practices of China, Holland, and other foreign countries.

There cannot be a doubt that the flooding of land in warm weather or during the heat of summer with river-water or the sewage of towns is calculated to promote the growth of a vast variety of insects, and that a large number of these are led by instinct to prey upon and infest cattle, and even the human race, in more ways than one. But before entering upon the details of the proposition thus enunciated and involved, it may be as well in the first place to call in question the soundness of the theory now too commonly taught, that our own bodies and the bodies of our cattle are the natural grounds for the pro-

pagation of these parasites, for the order of creation at the beginning of time, as regards the present inhabitants of our globe, proves the contrary, at least so far as man himself is concerned, and also our domestic animals. In other words, the parentage or progenitors of the flukes that now infest the livers of sheep, and of the bots and worms that are found in the intestines and flesh of animals, and of man himself, existed before the sheep, ox, and man existed, and it would be absurd to suppose that this prior existence was not natural. The one half of the lower creation may have preyed and lived upon the other half, but that is no valid argument for concluding that because flukes are now found living in the livers of man and beast, they were consequently at the beginning created in the livers of man and beast, *i. e.* man was created with flukes in his liver! or that Adam was created with worms of any kind in his body! or that the sheep was at first created with flukes in the liver! and so on. All such absurd doctrines in natural history must be tossed to the winds as out of date a century at least.

It will no doubt be said, in reply to this refutation, that the curse pronounced upon creation on the fall of man gave a new nature as it were to these parasites, and that ever since man and beast have been infected by parasites of the kind in question, consequently that the new order of things must now be considered the natural one, so that the primitive rule of paradise has become the exception.

Into a speculative controversy of this kind it is not our purpose to enter on the present occasion, and therefore we shall concede, for the sake of argument thus far, by taking things exactly as they now are. But the intelligent reader will readily perceive that this concession is not assuming that the primitive law of Nature has been abrogated, but the contrary; for, granting that it has become the exception, it still exists, and therefore the parasites in question may propagate their species in certain localities out of the bodies of man, sheep, and black cattle, in perfect harmony with the laws of their nature. In point of practical argument, this is the grand question of questions, that to which we wish to turn special attention; for, if flooded grass-land, or stagnant shallow water in which vegetation and the decomposition of vegetable matter

bound, is the natural habitation of flukes and the other parasites, according to the primitive law that parasites now infest our cattle under the existing order of things, then it is manifest that the application of sewage to grass-land, on the flooding principle, involves all the apprehensions to which Dr. Cobbold and the medical profession are now turning our attention; and consequently, that the more scientific, artificial, extensive, and sounder established practices of China, Holland, and other places, should be followed by the British agriculturist—of course, under all the improvements involved in vastly superior chemical and mechanical appliances.

We are not an alarmist under any circumstances, and, therefore, while we keep closely in view the more enlightened liquid-manure practices for future adoption, we at the same time advocate the more practical doctrine, viz., *to the land with the sewage of towns on the flooding principle, if a better system cannot be carried into immediate effect.* According to the old proverb, "Rome was not built in one day," and so it is with the progress of improvement in this as in every other branch of agriculture. We get to the top of the ladder step by step: some clever people, it is true, go up two steps at a time; but for all that, the step by step folks are never far behind. Indeed, it may safely be said that the single step is the safest practical rule, and to this rule the successful utilization of sewage is no exception.

Such being the peculiar position of things, the practical question resolves itself into the best plan of preventing the growth of parasites in our sewage-flooded meadows, and in the bodies of our cattle. Granting that sewage-flooded meadows form a natural habitat or breeding-ground for those parasites that infest our live stock, yet certain physical conditions are necessary for certain species of parasites in order to enable them to multiply; such being the natural requirements, it follows that if we can by artificial means destroy those requirements, we at the same time prevent the propagation of the whole brood of parasites that now infest ourselves and our cattle, a brood which at the present time is giving rise to grave apprehensions in the minds of not a few economists.

The work of prevention in question has reference, firstly, to the best method of applying sewage to the land on the principle of gravitation, or flooding, so as to keep down the propagation of certain parasites, whose ova are presumed to be in the sewage, to a minimum; and secondly, to the best method of cropping the land thus manured, and consuming its produce, so as to prevent our cattle from being affected with worms, or to prevent a lax condition of the tissues and a morbid state of the fluids, calculated to promote the growth of worms in the bodies of our cattle.

Into the details of these two practices we cannot go, as they form two separate and distinct subjects that would require two correspondingly different headings to do them justice. All, therefore, that we can say on the first subject is this—that if live ova are in the sewage, or present in the land to which water or sewage is applied, and if that water or sewage is allowed to stagnate under the heat of the sun, as to supply the natural liquid conditions necessary to their being hatched, then the upshot need not be told; for, in a very short period of time, such conditions will soon give birth to a brood whose number the best arithmetician dare not attempt to calculate. These, again, are presumed to enter our cattle in various forms—along with the vegetable produce of the lands; or by attaching their ova to the coats of animals, to take them into their stomachs by licking the parts; or by entering the skins of animals, and depositing their ova; or by entering the respiratory organs with the foul air inhaled, and so on.

Such being the facts of the case to which we propose confining our observations, they may be resolved into the following three practical questions, viz.:

First: Can the sewage of towns be so doctored by chemical means as to destroy the ova of the parasites in question, or otherwise neutralise its tendency to produce them, or its fitness to support life—granting that the conditions to hatch ova are present—without, at the same time, injuring the fertilizing properties of the sewage?

Second: Can the ordinary produce of land, such as Italian ryegrass or meadow grass, which has been manured with town sewage or liquid manure of any kind, on the principle of gravitation, and consequently under less or more stagnation of

the fertilizing liquid, be so mixed with other vegetable matter possessing anthelmintic properties such as would prevent the growth of worms or parasites of any kind in our cattle?

Third: Can plants possessing anthelmintic properties sufficiently powerful be grown, either along with ryegrass or other vegetable product, fit for feeding material for live stock, under sewage culture, or be grown by themselves, and afterwards mixed with the grasses, so as to produce a wholesome diet for cattle?

Generally speaking, we aver that an affirmative answer may safely be given to each of these three questions. No doubt, on entering upon the practical details of each, many qualifications may be necessary; but, in this respect, they are only similar to all other questions in agriculture of a kindred character, in not a few of which the exception becomes the rule, owing to the many imperfections attending the best-performed manipulations of the agriculturist. Thus how often do we find two neighbouring farmers exerting all their skill and professional talents to carry out into practice identically the same theory! yet results prove that very great differences must have existed in the more minute details of their respective practices; in other words, the two practices, in point of fact, were different, otherwise the results of both would have been similar. Fallen Humanity is even prone to father Nature, with all her shortcomings; but, when brought to the clear light of day, her illegitimate offspring leave no doubt in the mind of the observer as to their true parentage; and it may safely be added that sewage-farming will be more than ordinarily prolific in this respect. But in doctoring sewage, or the land to which it is to be applied (for both problems are included), or the produce of land that has been manured with sewage, or in growing new products, the practice is, by hypothesis, in each case assumed to be successful; otherwise it falls to the ground as an abortive experiment. If, on the other hand, the reader hesitates to subscribe to an affirmative answer to the first question, then the Chinese, Flemish, and other liquid-manure practices may be quoted, in which insectivorous life is destroyed, although the produce may by over-luxuriance be etiolated, and hence liable, under certain conditions, to produce a relaxed state of the tissues, and eventually worms, intestinal, skin, and other maladies of a kindred character.

But we need not go so far as China, or even the continent of Europe, in search of counter-examples; for the old familiar practice of sheep-folding affords tangible evidence to the contrary—that the fresh droppings of sheep and neat cattle may be applied to land without producing worms, even when the animals themselves are greatly infested with them, such as sheep turned into a field of fallow when under the last stage of sheep-rot. In the second and third examples, equally strong practical evidence might be quoted in support of the general conclusion, did our limits permit.

It will no doubt be said, in answer to the old practice of sheep-folding, that the droppings are not doctored by chemical means, and hence that it is not applicable to the proposed practice in question. But the objection thus raised is easily refuted; for Nature supplies the chemical means in this case, which art or the farmer is presumed to supply in the other. The reader who has not studied the chemistry of the parasitical life in question from a practical point of view, must be reminded that very little change is necessary to produce very important results; for if a nostrum is applied of a repulsive instead of an attractive nature, the upshot will be no parasites, but, *vice versa*, an abundance if the nostrum is attractive. Taste and smell have been pronounced by the highest authorities in this branch of science to be two chemical processes; and it is a well-established fact that these two processes, taste and smell, have much to do in the propagation of the parasites in question. We readily grant that the practice involved in this "repulsive doctrine" is surrounded with many difficulties; but in conceding this, we must also, at the same time, remind the reader that such difficulties do not stand in the way of discovery in chemical science. In point of fact, they are, on the contrary, the finger-posts that indicate the line of progress—"necessity being the mother of invention."

The general conclusion to be deduced from these observations is obviously not so unfavourable to the application of town sewage and other liquid manures to land, on the principle of gravitation and flooding, as not a few economists at the present time are apprehensive, provided the practice is properly

carried out in accordance with the whole of the requirements involved, as demanded by the health of our cattle. In other words, under properly improved management, the health of cattle may be preserved; whereas under the old, antiquated, and objectionable routine the contrary will be the inevitable result. Over-luxurious and etiolated herbage, produced under the Chinese, Flemish, or any other system of manuring—as an

extra dose of guano—will produce bad health and worms: so that the differences between certain practices that are inimical to the health of the farmer's live stock involve a practical problem not very easily solved in accordance with the demands of successful farm practice. The two practices may, in point of fact, be followed by two different farmers with the most opposite results.

## MALTING BEANS AND PEAS FOR CATTLE.

[We have been requested to publish the subjoined correspondence.]

[COPY.]

*The Hall, Attleborough, Norfolk, April 20th, 1865.*

To the Right Hon. the Chancellor of the Exchequer, &c., &c.

SIR,—The farmers have undoubtedly a right to feel obliged to the concession made in respect to malting corn for cattle. It has been proved beyond doubt, if properly managed, to be a most valuable condiment with other food, especially for sheep, and were it not for the indispensable restriction of grinding it would be more so, and there would at this time be a very large quantity used for lambs, with succulent grasses, especially beans and peas. It has been my opinion for many years that malting for cattle would one day become an art and a study, if the trade could be thrown open; and the more I learn from practical results the more I am convinced of the fact that brewers' malt is not the essence of perfection for feeding purposes. I was very anxious to have tried a few score of beans and peas malted for my flock (about 1,000 head), but the grinding renders the trial as valueless as that published by the Board of Trade; and they have now only to seek for unbiassed information to test the truth of my assertion. My intention was to have had these beans and peas slightly sprouted, and not too highly dried, and unground; my object being to render them brittle, easier for mastication, lighter for digestion, thereby more nutritious and not so heating as the raw article. The farmers and the public will shortly know their doom. But surely if your plans are not sufficiently matured to give us total repeal (from information derived from the Inland Revenue Office, which appears to take especial interest in the malting and brewing monopoly, if their report, as published by Mr. William Gurdon, is to be taken as a guide) this session, arrangements might be made to grant the free and unrestricted use of beans and peas. I am not aware it could in any way interfere with the revenue. No doubt the present style of English beer is a compound difficult to define, but I have not been able to ascertain beans and peas form any part in the decoction. If it would not be considered presumption, I should like to know, in the event of the malt-tax not being repealed for a season, whether there could not be some arrangement made relative to the unrestricted use of beans and peas for feeding purposes. Many of my brother-farmers are anxious to know your views, and if we are likely to have a chance given us to compete against the extraordinary importation of fat cattle—a most serious consideration to every grazing district. I am a farmer, and have been somewhat largely concerned in landed property in several counties, for thirty years, as agent and public valuer, and the sentiments I have expressed are entertained by a very large majority of the tenants. Agriculturists seldom or never unite or interfere with state or political matters; but the severe pressure that now hangs over them, and indeed every branch of their calling, has aroused a strong feeling of suspicion that their passive, and, I may add, loyal demeanour, has acted prejudicially against them, and that the hackneyed phrase, "the farmers' friend," has been a snare and delusion, and it is now time they should put their shoulders to the wheel. I have repeatedly been told you are ever ready and willing to hear all sides, and I must plead that as my excuse for thus trespassing on your valuable time; and I trust you will be able to arrive at a just verdict, and by judicious legislation place the farmers in the position to pay their full quota of the incometax; for it is contrary to common sense and reason for them to pay only 3d., if their present condition is sound, while the rest of the community are charged 6d. We live in a free country, and every Englishman ought to contribute willingly towards the support of its liberal institutions, but I think it is admitted on all sides that the malt-

tax is unequal, oppressive, and not in accordance with free trade principles; but in the same breath we are obliged to add, "how are we to spare the money?" It is an old adage "where there's a will there's a way," and I hope you will be able to solve the problem and satisfy yourself—some parties will be sure to grumble. The malt-tax I presume realises round figures, £5,000,000 net. I trust you will shortly be able to announce you have £2,000,000 to spare towards repeal, leaving £3,000,000 to be made up. Select £40,000 of taxes, to which add 5 per cent. so long as required. That will raise £2,000,000, which, if the taxes are equal now, no one can complain of. Draw out a graduated scale for raising £1,000,000 under Mr. Gurdon's plan, or some modified adjustment, and the difficulty is solved in the opinion of one who begs to subscribe himself, with great respect,

Your most obedient and humble servant,  
THOS. FISHER SALTER.

[COPY.]

*"Inland Revenue, Somerset House, London, W.C.  
2nd August, 1865.*

"SIR,—On the 21st of April last, the Chancellor of the Exchequer referred to this board for their consideration a letter you addressed to him on the subject of malt for cattle-feeding purposes. This board regret the delay that has taken place in their reply to your suggestions, but much time has been occupied in the experiments that were necessarily required. I am now to inform you that there will be no objection to your using unground malted beans and peas, or malt crushed under rollers, provided the linseed or linseed cake be first mixed and crushed at the same time with the barley malt cannot, however, in the interests of the Revenue be allowed to be used for cattle-feeding purposes.

"I am, Sir, your obedient servant,  
"WM. CORBETT, Sec."

[COPY.]

*"The Hall, Attleborough, August 4th, 1865.*

"SIR,—I beg to acknowledge the receipt of your letter of the 2nd August, relating to malted corn for cattle, for which I am obliged. With regard to beans and peas, if I understand your letter correctly, there are no restrictions; therefore, I can have them malted at any malt-office nearest to my occupation free of duty. The restrictions on barley remain the same, with the exception that it may be crushed under rollers with the linseed, instead of being ground.

"Allow me to remain, Sir, yours most obediently,  
"THOMAS FISHER SALTER.

"W. Corbett, Esq."

[COPY.]

*"Inland Revenue, Somerset House, London.*

"SIR,—Your letter of the 4th instant, addressed to the secretary, having been laid before the Board, I am directed to acquaint you that peas and beans may be malted, duty-free, for cattle-feeding, without any restriction, except that the process must be conducted at an entered malt-house, and the maltster must give the local officer twenty-four hours notice before he steeps the peas or beans, and keep them at all times separate from grain or malt in the malt-house. Barley or other grain, malted duty-free for cattle-feeding, remains subject to all the established restrictions, except that the malt may be crushed under rollers with the linseed cake, instead of being ground; but a sample of the mixture must be submitted for approval.

"I am, sir, your obedient servant,  
"ADAM YOUNG."

## EXPERIMENTS IN CATTLE FEEDING.

Last spring, Mr. A. Smith, Stevenson Mains, East Lothian, who has given much attention to the fattening and rearing of stock, having a pretty large quantity of potatoes on hand about the time when he was beginning to feed off his cattle, thought of trying how they would thrive on a potato diet, with the usual quantity of oilcake. The cattle were accordingly fed off with the potatoes, and thrived so well on them that he resolved on testing the qualities of the root still further this season, by feeding from first to last entirely on potatoes. He at the same time, for his own guidance in carrying out the pulping system, to which he is a convert, made a separate experiment to test its value as against feeding in the ordinary way with sliced turnips. A lot of cross-bred shorthorn stirks, rising two years old, were bought by him at the Linton October market last autumn, and divided as equally as possible with regard to condition, size, and so forth, among three courts. The lot numbered twenty, six of which were to be fed on potatoes, seven on pulped turnips, and seven on sliced turnips, with the usual allowance of straw in each case—the pulped-fed cattle getting theirs chopped. From the moment they entered the courts, up to the month of March, when the whole of them for the first time, and in the same proportion, got oilcake and barley-meal to finish off, the cattle were kept exclusively to their own kind of diet.

A very short time served to show which was the most nutritive article of food. Almost from the first the potato-fed cattle took the start of their neighbours, and, to use a racing phrase, were never headed, but came in at the finish a good way in advance of the others. They took to the potatoes with the greatest relish, and never gave the slightest indication of "hoven" all the time they were being fed on them. In fact, no beasts could have given less trouble or anxiety from the day they were put into the close till they were taken out in the early part of May—a period of about seven months. While the experiment was thus satisfactory with regard to what we may call the No. 1 court, it was not the less so as respects No. 2—the court containing the cattle fed on pulped turnips. These also, almost from the beginning, evinced a superiority over their neighbours fed on the sliced turnips. They were decidedly in better condition, and brought more money—perhaps the best test of all that they had been better fed. The cattle, as we have said, when they went into the courts, were placed as nearly as possible on an equality, and their difference of condition at the end of the experiment was solely due to the difference of feeding. The average price obtained for the lot was £17 5s. each. They were sold privately, the value put on them by the purchaser—a dealer of judgment—being as follows: No. 1 court, £17 15s. each; No. 2 court, £17 5s.; and No. 3 court, £16 15s. In other words, the potato-fed cattle brought 10s. a head more than those fed in the ordinary way.

The value of the experiment consists of course in the expense of raising the different lots, because if No. 3 court were fed off cheaper than No. 1 court, no inducement is offered to make any change from turnips to potatoes. This point can be satisfactorily answered. Each of the courts was supplied with a daily allowance of turnips carefully weighed or measured, and it was found that while in the case of the No. 3 court the seven cattle consumed 11 cwt. of turnips per diem, those in No. 2 court were well and better fed with 9 cwt., or 8 cwt. per day less. This was a direct saving in the cost of the turnips; but it also saved, a matter of some consequence, the expense of carting the extra quantity from the fields, which could be much more easily and profitably eaten off by sheep as they lay in their drills. As a set-off against this, there is, no doubt, to be placed the cost of the pulping; but this is not a very serious matter. Mr. Smith does not employ steam for the purpose at Stevenson Mains, but has a one-horse power machine, which he finds answer extremely well. The amount of work which it gets through is large, amounting to about 3 tons per hour, amply sufficient for the wants of a pretty large number of cattle we should fancy. There is also the wages of the girl who attends the pulping machine when it is in motion; but making every allowance for these items of expenditure, Mr. Smith is quite convinced, from his experience of the system, that it is, when properly conducted, in every way more profitable to pulp than to give cattle the turnips simply sliced. His experiment this year seems to prove that not only can they be fed on a less quantity of turnips, but that they bring a better price when fat than the others.

Taking the value of a ton of turnips at 10s., the average weekly cost of feeding the No. 2 cattle amounted as nearly as possible to 4s. 6d. per head, while the No. 3 cost about 1s. per head more. The calculation can easily be made, and will be found as stated. But the potato-fed cattle show a considerably greater saving. The courts were put under the charge of a careful and experienced cattleman, whose instructions were to note down exactly the amounts consumed in each close. From the book which he kept, we find that the six cattle in No. 1 close only consumed a weekly average of about 15 cwt. of potatoes, which at 25s. per ton gives 3s. 1½d. as the expense per week of feeding each beast, and feeding it £1 per head better than with food that costs 2s. 4½d. more money weekly. It is also to be remarked that the potatoes used were unmarketable, in so far that the firsts and seconds had been selected from them, and were only available for the starch mill off for feeding purposes. So satisfied is Mr. Smith with the result of his carefully-conducted experiment in potato-feeding, that he intends continuing it next year on a larger scale. He has no doubt as to its being the most profitable, as it is undoubtedly one of the easiest, modes of fattening lean cattle for the market.—*Haddington Courier*.

## THE CULTIVATION OF THE FINER KINDS OF BARLEY.

The great and permanent improvement which has been made upon agricultural produce of almost all kinds by a judicious and well-conducted system of culture, must be too obvious to even the most careless cultivator of the soil to require any lengthened comment in these columns.

Above all, the great and still increasing attention which has of late years been paid to the cultivation of the different varieties of the wheat plant is a matter of no small congratulation to the farming community. The unique and somewhat remarkable collection of the different varieties of wheat exhibited recently in Edinburgh by Mr. P. Sherriff is at once a proof of the great interest taken in the matter, and the success which has already attended the raising of new and improved varieties. So far as the wheat plant is concerned, farmers have now such an extensive assortment of red and white,

bearded and plain kinds to choose from, that no one need have any difficulty in making a selection of seed likely to suit his particular soil. Indeed, as not unfrequently happens when there are too many good things to choose from, there may be some difficulty by-and-by in coming to a decision at all among such a rapidly-increasing and rapidly-improving collection of varieties.

As so much has been done for the improvement of the wheat plant, which unfortunately for wheat growers is not bringing a very remunerative price at present, and in all probability is not likely to bring a high price soon, it has been suggested to us that something might be attempted in the same way for the improvement of the other cereals, and especially of barley, which can still be cultivated with less risk and more profit than wheat.



With regard to the improvement of the quality of barley, the matter is one of so much importance that it is surprising it has not attracted more notice, and been entered upon at least with nearly as much spirit as has characterised the operations of the gentlemen who have brought the wheat plant to its present condition. Now, however, that a little more dependence will in all likelihood be placed upon the cereal, it may confidently be expected that more attention will be paid to its cultivation; and the present time seems a favourable opportunity for bringing the matter under the consideration of all whom it may concern, with some chance of obtaining a hearing.

In the cultivation of barley, as well as of the other cereals, there is no doubt that some attention must be paid to quantity as well as to quality. In dull times such as the present, or indeed in any contingency of markets brisk or dull, a few additional quarters to dispose of will always be a matter of no small value to the tenant farmer.

In the case of the finer kinds of barley, however, quantity may with little hesitation be sacrificed to quality; and the improvement of the quality is at present the great desideratum. Maltsters and distillers are of course the principal buyers of barley, and there is no way in which its quality can be better tested than on the malt floor. The wide difference which is found by maltsters between almost similar samples of barley, after they have been subjected to this test, is such as would scarcely be credited by those unacquainted with the malting process. It is particularly with reference to this phase of the subject that we at present advocate the necessity for a little more attention being paid to it.

The fine Norfolk barley, for instance, when placed upon the malt floor, will be as far advanced for malting purposes in the course of twelve days as the common barley grown in East Lothian or Fife will be in eighteen or twenty days. This of itself is of no mean importance to the maltster, especially if his accommodation is limited and his orders are pressing, as it gives him the advantage of having three floors in the time taken by two. This, however, is a small matter when compared with the difference after it passes from the kiln. In the case of the best English barley, the saccharine or sugary matter becomes so dry, free, and pulverous in its nature, that it may be taken and rubbed between the fingers like whiting or flour.

The result of this is that, when it comes to the mash and wash-tube, there is little or no sediment left behind. The whole strength, indeed, of the grain has been extracted, and in less than half the time required for the common Scotch variety.

The more common barley never acquires this free and pulverous character. There is always somewhat more of a glutinous nature about it, and the mash is full of hard granular particles which look like a sprinkling of rice, and which, of course, never yield the saccharine matter contained in them. The process, therefore, is not only a much more tedious one in the case of the coarse and common varieties, but the result is also much more unsatisfactory. There is not only nearly double the time consumed in the various operations, but there is much more loss in the matter of refuse.

There is no doubt that there is much, very much, in soil and climate which must be taken into account in producing superior quality. With all due allowance for these, however, there does not seem any good reason why East Lothian should not produce as fine a quality of malting barley as the eastern coast of England. There is not such a wide difference between the two localities but that a much nearer approximation at least might be made. Whether this might be best effected by a regular and systematic change of seed from these more favoured localities, or by cultivating and endeavouring to improve—as has been done so successfully with the wheat plant—the finest of the barley at present grown in the district, is a subject for more mature consideration; but there can be little doubt that a regular changing of seed would have some effect upon the produce. The sample might degenerate in the course of a year or two; but granting that it does so, there is still the same course open, namely, to change the seed again. In this way, if in no other, a nearer approach in quality than there is at present to the finest English barley might be kept up, not without a little trouble certainly, but a trouble which would ultimately bring its own reward in the higher price obtained for a better article.

The subject is one which should be taken up by all whose farms are adapted for carrying it out, and more especially at the present time, when there is so much necessity for "making the most of it."

## SALE OF LONG-WOOLLED RAMS.

Messrs. Salter, of Attleborough Hall, held on Thursday, Sept. 1, their fourth annual sale of Lincolnshire tups, descendants of the Biscathorpe flock. The reputation the Messrs. Salter's sheep have already acquired in this neighbourhood, in addition to the adaptability of the improved Lincolnshire breed for crossing with the brown and black-faced ewes still in favour with the Norfolk flockmasters, was an attraction sufficient to bring together upwards of 150 of the most business men and largest breeders in the county. This large company of beginners, as the Messrs. Salter, it may be said fairly, term themselves, augurs well for the future history of the Attleborough Hall flock. And when it is said that the flock at present is only 200 stock ewes, and 100 shearlings were brought to the ring for sale and letting, it will be farther believed that this flock is full of promise. Of these, 80 were sold for £838 5s., or only 35s. under 10 guineas each. The remaining twenty were young and twin sheep, or promised to grow into good two-shears for next year. When it is further said, as one may judge, that only fifteen male lambs of the last year's fall were withdrawn for wethers, it will be allowed that the Messrs. Salter have, in the drier climate of East Norfolk, fairly distanced many breeders of these sheep in their native county. To have half as many shearing tups as there were ewes lambed down brought to the hammer as shearlings, in fine working condition, and all nearly equal in value, with the few good exceptions that always arise, according as the breeders requiring them may think them adapted for their ewes, is certainly an accomplishment that few men in the fourth season can congratulate themselves upon. This, however, has no doubt arisen in a great measure from the Messrs. Salter not having flinched at the first outlay, nor at trying to improve the character of their flock by successive purchases of

the best sheep they could find—that is, so far as the tups they have annually purchased were thought to be suitable for the particular ewes they wished to improve upon.

In regard to the long wool retaining its lustre and quality of fibre in this drier and warmer climate, we may say that we have never seen more uniformity of fine qualities; and this opinion was confirmed by Mr. W. Neal, of Ely, who has bought the Messrs. Salter's for three years, and who said in a letter to Mr. Simpson, the officiating auctioneer, on Thursday last: "I have said to many friends it was the best parcel of wool we have sent to Bradford this season. The party to whom it was sent say the same, and that it is very much superior to the bulk of wool grown in our district." Some of this the Messrs. Salter attribute to their practice of spreading straw over the land; for, as they say, much damage is done to long wool by its being frozen to the ground in winter, for the sheep on rising break some and stretch more to an extent, that it afterwards grows deformed, becoming "knotty" a defect which is very injurious and therefore watched for by buyers. But from the sheep having straw to lie on, instead of bare soil or rooted grass, on their rising the loose straw sticks to the sides of the sheep, and falls off soon after from the heat of the body or the sun melting the ice by which it was attached. This, however, has nothing to do with the lustre, and, so far as we could perceive, this important quality is not in the least diminished.

Among the gentlemen and buyers on the ground were, W. Bagge, Esq., M.P., for West Norfolk, and C. S. Read, Esq., M.P. for East Norfolk; Captain Caldwell; Von Staveren, from Holland; Messrs. R. Leamon (Whitwell), S. K. Gayford and T. and H. Gayford, F. Edwards (Barnham, Suffolk), W.

Jelling (Thetford), and C. and —. Jelling, H. Aylmer (West Dereham), W. Elliot (Rushford), H. Wood (Merton), J. Turner (agent to the Marquis of Bristol), W. Biddell (Hawstead, Suffolk), Wells (Haverland), Reeve (Snettisham), G. Barton, T. Matthews, jun. (Tompson), J. Gates (Brandon), A. H. Bartlett (Thetford), J. Peto (Barningham, Suffolk), &c., &c.

The prices the sheep made were of a very uniform character, which indicates the "family likeness" of the flock more than if a few higher prices had been made, and these had brought the average up to the 10 guineas. The highest price was £20, which was given by Mr. Edwards, who bought five others at prices between £8 10s. and £12 10s. Mr. Turner bought four for the Marquis of Bristol at prices from £10 to £12 10s. These are for putting to pure Southdown ewes, which shows the change which is undergoing the minds of fashionable breeders before the high prices of mutton and long-wool. Mr. Gayford of Wretham bought two at £12 and £9 each; Mr. Seamon three at £10, £10 10s. and £11 respectively. Mr. W. Jillings bought No. 1 at £17, and two others. Messrs. J. & C. Jillings bought two each. Captain Caldwell bought one at £14, and one at £13. Mr. Limmer bought 4 at store prices, which varied from £9 to £12 10s. The remainder were sold according to their form and the appreciation they met with by the company. The 20 shearlings that were let made proportionate prices.

Of ram-lambs there were 35, which were let. The first made £9 to Mr. Myhill. Mr. Tingay took two at £7 10s. Several were let at £6 the pair, some at £5, and three at £3 the pair for the season. These of course will return, if they do well, and be some of the shearlings for next year's sale. It is here generally considered that strong lambs, if taken good care of, improve by being used as rams. Lambs are greatly preferred for begetting lambs for fattening.

Fifty shearing ewes were offered, as the Messrs. Salter wish their neighbours to try some of their breed, as against the brown-faced ones of their own flocks. But only 3 ewes exceeded the up-set price of £3, and these made 63s. and 65s. each.

Before closing this notice of the Attleborough Hall sale, we cannot do less than remark that the system of spreading straw on the fields for sheep to tread in answers as perfectly as we said last spring it promised to do. All the roots are here sown with one ploughing 11 inches deep, and nothing can be expected to look better than they now do. As will be remembered, the quantity of corn fed per acre was about one ton, as the roots were last year so few. Beyond this, no other manure has been used, and on these 11-inch furrows, or rather depth of mould, there are some wonderful mangold, capital swedes, and white turnips, and, for the season, those crops are unusually clean. This may in some measure be accounted for, after the showery weather we have had, from the seed of annuals near the surface after the 11-inch turning-over having had time to vegetate, and were therefore harrowed up at the time of sowing the crop. These roots will be nearly all consumed as before described. About two-thirds will be taken to adjoining fallows, and one-third be fed in some cases on the field for the barley or spring oats. The cartage saved by this practice is of immense importance. The improved condition of the land is, however, of greater importance. The present stables will be as usual forked over, to raise out the few roots of twich that will gather by the end of a course. This is done at the cost of 2s. 6d. to 3s. per acre, and is no doubt the cheapest as well as surest method of keeping land free of this troublesome plant.

Last year the Messrs. Salter were so hard up for feed for sheep that they fed off a piece of lightly podded beans. This makeshift, as it was looked upon at the beginning, proved so advantageous that this year several acres of part bean and part rape or turnips have been sown, and are being fed off together, the ewes having a few rods nightly. By this feed the ewes are clean and healthy, although they are on a piece of sappy over-grass. They eat the stalk and all down close, and the cheapness of this practice must be also greatly in its favour.

There are some other interesting points worth noting, but our space compels us to defer a notice of them.

The CHAIRMAN, after luncheon, having given "The Queen," and "The Prince and Princess of Wales," next proposed "The Army and Navy," coupling the name of Captain Caldwell, who briefly returned thanks.

The CHAIRMAN next proposed "The health of the County Members."

Mr. C. S. READ, M.P., who received a hearty reception, said he saw by the expression of some of their faces that they were inclined to ask why he rose before Mr. Bagge. The East Norfolk election took place a few days previous to West Norfolk; and he, a young man, took precedence of their old and tried friend Mr. Bagge. He could remember that he was a little boy at school when Mr. Bagge was first returned for West Norfolk, and that he then received his first black eye in vindicating the independence of the electors on that occasion. Exceedingly pleased he was to see Mr. Bagge looking so blooming and young, and representing them once more. He thanked them most heartily for the kind way in which they had received the toast of the county members, and remarked that it was one of the greatest honours that had been conferred upon him in being associated with a man so able and so hard-working as Mr. Howes. He would not talk about the cattle plague or politics, or even directly about the malt-tax, but he would say a word upon Mr. Gladstone's "Malt for Cattle Bill." He took his sample of barley, about this time last year, to market, and was bid ninepence per stone for it; but he did not like the idea of paying double the price for the same quantity of Mr. Gladstone's mixture. He therefore kept his barley and bought malt, and, from his experience, he was perfectly satisfied with the result. But what he wanted was, that they should be more accurate; he wanted them to vary the experiment in every possible way, so as to convince Mr. Gladstone that malt food was not altogether a fallacy. His own experience was, that malt should not be used in very large quantities, but that it was very useful as a condiment, seasoning a large quantity of unpalatable food, and thus carrying out the scientific opinions of chemical professors, who told them that it made a large amount of the food they gave to cattle more palatable, more soluble, and more digestible. Seeing so many practical men about him, he asked and entreated them in the coming winter to try a little malt, and give them unreservedly the results of their experiments. There was one little bill passed at the end of the old Parliament, "The Weight by Malt Bill," which was passed for the express purpose of taking off the extreme pressure of the malt tax upon the occupiers of heavy land. In his opinion it did no such thing. They would find that almost every sample of barley from off the light land was coarse and heavy, and he thought the proper title for the bill would be "A bill to grant facilities to the maltster for importing light, bright, and foreign barleys, to the further prejudice of the British farmer."

Mr. BAGGE, M.P., who was also most warmly received, was sure that, in all his excursions through West Norfolk, he had never met with such a reception, particularly in the neighbourhood of Attleborough. Generally speaking it was frost and snow in that locality; but he concluded that, being under the hospitable roof of Mr. Salter, one side or the other would receive him thus heartily. That was the first time he had ever done himself the honour of attending Messrs. Salter's meetings, but he trusted that it would not be the last. He again thanked them for the warm reception they had given him, and resumed his seat amid expressions of favour. He, however, again rose, and proposed the health of the Chairman.

Mr. S. K. GAYFORD, in returning thanks, said he was much indebted to them for the kindness evinced towards himself, and he thought they would agree with him that the stack-yards of West Norfolk were seldom, if ever, worse filled and in worse condition than they were this year. When they looked round that well-filled barn, and stepped out upon the green hills, and saw that the sheep-pens were also well filled and that the animals were of good quality and in fine condition, they would say that there was never a rule without an exception. He had known a good deal of Mr. Salter's transactions, and that he had spared no pains and expense to bring his sheep to perfection; and he was much delighted to see such a company present, because he felt certain that there must be a good sale. If there were any present who had purchased Mr. Salter's sheep, and mixed them with tups of a different breed—whether two or three of Mr. Salter's tups with two or three of any other breed—and had not produced a flock of lambs such as they had wished, they must not be disappointed, because he felt that the result was certain. Every flockmaster's object ought to be to select his ewes so as to get

them as much alike as possible, never losing sight of quality, a fair quantity of wool, and perhaps just now a large quantity of wool. Some at present might be large purchasers of beasts, and it was certain that every man present would put his hand on his beasts to know the feel of the skin; but there was just as much in the pelt of a sheep as there was in that of a bullock.

Mr. C. S. READ, M.P., in proposing the health of "The Flockmasters," associating with the toast the name of Mr. Bartlett, was happy to say that at the present time wool and mutton were fetching capital prices.

Mr. BARTLETT feared that he should cut a very poor figure with many of the large flockmasters around him. He congratulated them on their election of members for the county, and said that the acquaintance of the tenant-farmers was as deserving of cultivation as that of the landlords. Having complimented Mr. Salter upon his excellent show of sheep, he thanked them for the honour paid him.

The CHAIRMAN then proposed "The health of Messrs. Salter."

Mr. SALTER, in responding on behalf of himself and brother, said they were proud to see so many present, and they should be proud to meet them for years to come. He felt that they must have given some satisfaction to his friends and neighbours, else he should not have increased his number of visitors so largely; and assured them that he had done his best as a farmer, to produce such animals as he believed were required by them. It was his endeavour to combine wool and mutton, to get Lord Walsingham's Down carcass under a long-wooled fleece; and he thought, that in the lot of sheep he exhibited that day, that was nearly accomplished. Nothing, he continued, should be wanting on his part to merit a continuance of their support and confidence, and he hoped that none would be disappointed in any animal they might purchase or hire, adding that no reserve bid had been put upon any animal, and that 100 out of 115 which he had bred would be put into the ring for competition. He concluded by proposing "The Strangers," coupling with the toast the names of Messrs. Biddell and Turner.

Mr. BIDDLELL, after expressing the pleasure he felt in being present at that meeting, said he had the cattle plague upon his farm, although he had not purchased any animals for eight or ten weeks, and although his cattle had not been within 400 yards' distance of any other animals. Whether the beasts became infected through the atmosphere, or the disease was conveyed to them by those pests, the flies, he must leave to those more learned in such questions; but he recommended all, if they would not be the losers in a pecuniary point of view, to join associations which had for their object the relieving of the losses of their neighbours. He congratulated them upon the opportunity they had of replacing the bullocks by a kindlier and more profitable animal; for, as far as he was a judge, they had a good article in Messrs. Salter's sheep, which were well adapted to the purpose to which tups were applied. It was a prevalent opinion that the disease in cattle affected beef-eaters, and he, therefore, recommended them to turn their attention to the growth of mutton.

Mr. TURNER also responded.

Mr. WOOD proposed "The health of the Wool Buyers," coupling with the toast the name of Mr. Neal, of Ely.

Mr. NEAL said he had purchased the wool of Messrs. Salters' sheep for some years past, and pronounced it to be of superior quality, and in very much better condition last year than he had previously known it. He sold it to a gentleman in Yorkshire, who stated that it was the best parcel he had purchased that season. There was no doubt but that the long wool commanded the higher price, and he advised them to cultivate it, recommending Messrs. Salters' sheep as fitting animals for producing the staple required.

Captain CALDWELL proposed "The health of Mr. Simpson," to which Mr. Leamon added the name of "Mr. Bacon."

Mr. SIMPSON returned thanks on behalf of Mr. Bacon and himself. After alluding to the fine quality of the sheep he had to offer that day, he concluded by proposing "The Ladies," and associating the name of Mrs. Salter with the toast.

Mr. BACON was taken by surprise to hear Mr. Simpson conclude by proposing that toast, as he had reserved it for himself, and had intended, in proposing it, to apologise for the absence of the Hon. T. De Grey, who should have proposed it, but was in the North shooting grouse. He hoped that he would be present next year.

## SHEEP SALES AND LETTINGS.

### MR. DAVY'S LETTING.

The Owersby rams of this year presented, on Monday, Sept. 4, a marked and very commendable improvement over last year: indeed, considering this is only the fourth season of Mr. Davy's special attention to ram-breeding, his progress is hitting off the public demand does great credit to his judgment and energy. Owing to the high price of wool and mutton, breeders have been determined in securing sheep for next which promised to produce great fleeces and carcasses that would pull down a heavy scale. How far this is right in principle we shall have occasion to argue more fully, in connection with other flocks, in the descriptive notices we shall have to give below. While, however, Mr. Davy's are of this great size there is every requisite quality in his breeding-ewes for him to warp his sheep when he sees fit to forms and sizes which, we will at once say, we consider more lasting and reliable for producing great weights of wool and mutton per acre. As the fashion goes, Mr. Davy is undoubtedly successful; for while it takes some years to get a fashion fixed in the public mind, it takes longer to change the views of which a fashion may be composed. Agriculture generally, and sheep-breeding in particular, are not exceptions to this action of the human mind.

By the prices we have to record, it will be at once seen that Mr. Davy had every reason to be pleased with the largely increased company which attended his auction-letting, and that the bidders were well pleased with Mr. Davy's sheep. The large number of 120 rams, viz., 70 shearlings, 36 two-shear and 14 three-shear, certainly composed a very imposing and attractive show. Their great size, heavy coats, and masculine heads (the skin of the latter organs being generally of the admired blue tinge) caused more than one ram-breeder and other good judges to speak of them, as a whole, as being a every way suited to the wants of the day. But with the figures we have before us further comment on our part would be superfluous.

The 70 shearlings let for £1,028, or, within a penny or two of an average of 14 guineas each; the 36 two-shear, and the 14 older sheep bringing the general average for the 120 at £13 1s. 6d. each.

The first strikingly noticeable sheep was No. 8, an animal of good form, legs short and true, and he carried a fine and good weight and fine quality. This sheep, in our opinion, will turn out to be as good an animal as any on the ground—particularly if the present fashion should change sooner than it at present promises to do. He was taken by Mr. Dadding, of Garthorpe, at £26. The next one was another excellent sheep, and, being larger and of good form, with fine pelt and bold head, as well as of a fat nature, he caused a good bit of spirited competition and was soon let at £76 to Mr. Garra, which adds additional interest to the high price he made, as this name will be recognized as one familiarly known in connection with the Cotswolds. Mr. T. Cartwright, a ram-breeder, hired the next one, at 31 guineas: this was a good thick sheep, of fair form, with a peculiarly pleasing expression of countenance upon a good bold front-piece. Mr. John Clark took No. 15 at £20, Mr. S. Hobbes No. 17 at the same figure, No. 19 made £31 to Mr. Mayfield for the Dogdyke flock, Mr. Dickinson took No. 22 at £31 10s., Mr. E. Davy took No. 24 at £17 10s., Mr. Bryn took No. 28 at £36, Nos. 32 and 34 made £19 and £20 to Mr. Haseltine, No. 33 was taken by Mr. Codling at £30, Mr. Game took another, No. 40, at £18, No. 42 was taken by Mr. Bartholomew at £18 10s., Mr. Richardson took another at £18, and Mr. Shrapley one at the same price. In the older sheep, Mr. Chatterton took No. 75 at £25 10s., Mr. Kirman No. 90 at £19, No. 110, a three-shear, was taken by Mr. T. Brown at the good price of £40, Mr. G. Clarke No. 112 at £24, Mr. R. C. Howard No. 113, a compact sheep of good quality, at £23, and Mr. Marshall No. 118 at £18. These few quotations will, it will undoubtedly be thought, fully bear out our remarks on the successful manner in which Mr. Davy has pursued this branch of his extensive agricultural business.

This notice of the Owersby flock would be incomplete unless we made some reference to its clip of wool. There were 930 fleeces, and their net weight was 375 tons. As may be judged, a large number of the fleeces were only two to a tod, and most of the rams cut considerably over the 14lbs. The whole clip

—ewe, tup, and shearing together—was sold on the 14th of June last at 60s. per tod. When these figures are carried out, and it is found that this growth amounts to over eleven hundred pounds sterling, it is not at all wonderful that the better judgment of some farmers, in regard to form and symmetry, should be carried away by their feelings respecting a "good skin," that is, a heavy fleece.

### THE BRANSTON.

These sheep sustain their well-known character for extraordinary size and great weight of wool. As Mr. Marshall says, "It is far more easy to work a flock up to an aimed-at character than it is to preserve whatever marked traits the judgment of a breeder may cultivate." But as Mr. Marshall has, in addition to his own four hundred breeding ewes, the advantages which belong to working with some relatives who possess several hundred more ewes, the issue of the Branston flock is tantamount to the produce of a very large stock. Sheep-breeding is like "change-ringing" on bells—if the number be doubled, the "changes" will be several times increased: thus, in sheep-breeding, under good judgment, every hundred added to the flock adds many years to the time that a flock may be kept together without any danger of degeneration from in-and-in breeding. Some idea of the substance of Mr. Marshall's sheep will be gathered from the following facts: A three-shear ram weighed the enormous weight of 31 stone 12lb.; a four-shear weighed 28 stone; a two-shear 27 stone 4lb.; another of the same age 27 stone; three shearlings, intended for home-use, average 22 stone 9lb., the heavier one pulling down 23 stone 12lb.; two four-shear ewes weighed the great weight respectively of 23 stone 11lb. and 21 stone 8lb., the latter being far from ripely fed. The produce of the wool of these sheep is also something extraordinary for the average per head. It cannot be expected that every fleece of this flock, with its great size, is of the finest quality; but much of it is; and there seems to be but a sixpence or a shilling a tod difference in the somewhat coarse fleeces of 18 and 20lbs. weight and the lighter clips of ordinary quality. Of course, the very fine and lustrous fleeces command a high figure for making imitation alpaca and fine mixed fabrics of wool and silk. But as the demand for flannel shirtings, and blankets is now great, and the serviceable fashion with tourists and sporting as well as business men of wearing cloth suits with rough surfaces continues, there is no present prospect of a fall in this character of wool; therefore quantity, when the form of animals is not neglected, is certainly more profitable at present, from the public demanding it, than is that fineness without lustre, which only comes into competition with the shorter wools, and which are at lower prices from the production of them now being so great in Australia, Hungary, Austria, and other parts of the continent of Europe, where the production of long-wool is either impossible or the yield is limited, from the climate being too rarified and otherwise unsuitable.

This year Mr. Marshall had 180 rams to let and sell, 120 of which are already disposed of. Mr. Marshall cultivates a foreign trade, which he has the better been able to do from having travelled a good deal in continental countries. He has for years been sending sheep to the following places:—Australia, New Zealand, Cape of Good Hope, Natal, Buenos Ayres, River Plate, North America, Canada, Germany, Holland, Denmark, Prussia, and Austria. These facts we mention as points of interest to show how the sons of Old England, when they become colonists, like to try experiments with home-breeds of sheep, the profits of which, in respect to wool they now hear so much of; and there is thus also shown the great foreign trade now done in these sheep, and how it is such foreign nations as Holland, Belgium, and other easily-reached countries were trying to improve their breeds for supplying the English markets with mutton.

### THE TEMPLE BRUER SALE.

The Temple Bruer rams sold on Thursday, Sept. 7, although they made the fair average of nearly 10 guineas each, were, comparatively speaking, barely half appreciated. One of the most inconsistent and anomalous expressions now prevalent is often applied to sheep of the Temple Bruer stamp, which are said to be suitable for breeders who fat their own shearlings, but not for breeders who sell at April Fairs! This governing principle, or rather proceeding without any true

principles at all, is altogether an almost incredible inconsistency, or breeders must be presuming greatly on the judgment of the men who go to April fairs to buy. If compact sheep, with wide quarters supported on truly-formed and stiff legs, be the more profitable stamp to aim at producing where breeders fatten off their own "hogs" or "wedders," surely, looking from a rent-paying as well as a public or general point of view, the same characteristics must be equally valuable for those feeders who do not breed but have to buy at spring fairs. If this be so, Lincolnshire sheep-breeding is reduced in some cases to the practice pursued by the razor maker—one sort is brought out for use and another class to sell.

We need not enter into lengthened individual criticism of the sheep brought to the ring by Mr. Robert Howard on Thursday last. It is the general outline and style of movement by the whole that one must judge by, to be correct. It is no secret that the Oxford Down was originally a direct cross between the Hants and Cotswold breeds. Nor is it studiously kept as a secret by Mr. Kirkham that the superiority attained by the Biscathorpe flock is due to the way the raw-boned, primitive Lincoln has been judiciously brought into form and toned down by the more elegant, and, before "coddling" animals was thought to be a scientific proceeding, the more profitable Leicester. Nor, again, is it any secret that Mr. Howard has used some of Mr. Kirkham's best-quality sheep.

We have said the lots averaged nearly 10 guineas. This comparatively low figure cannot be attributed to their want of size, for they were big enough in all reason. Their condition and quality, too, as displayed in the firmness and abundance of their flesh, and in the natural lustre of their wool, were subjects of some comment and approval: and judges seemed to have a growing feeling that there was something very good about them, if they could not screw their minds up to a full assurance that there were signs in the sheep before them that must some day tell on the flocks of the neighbourhood and county. Under this condition of intellect and feeling, a few lively nibbles and respectable biddings were, however, made. Mr. Dean bought 3 sheep, at £16 10s., £24 and £30 respectively; Mr. Bartholomew bought 2, at £18 10s. for one, and £17 for the other; Mr. Gilbert, of Blankney Heath, bought 1 at £18; Mr. R. Wright, of Nocton Green, bought 1 at £14 10s.; Mr. E. Dawson, of Glensworth, 1 at £14; and Mr. Woolhouse, of Wellington, bought 1 at £30. The remainder were sold at the usual prices given by store breeders for sheep with short legs, who fear that, therefore, they will not beget lambs that at April fairs will "well top the trays," that is, show the back above the hurdles!

### PETERBOROUGH NEW FAIR.

Mr. C. Clarke's Ashby-de-la-Land rams, which were sold by Mr. Law, made the highest average of the day. They were a lot of excellent shearlings, 60 in number, and they made £882, or an average of £16 12s. 9d. each. Mr. Parr, a ram-breeder, bought No. 25 at £50; Mr. Godfrey bought No. 23 at £46, Mr. Yoeman No. 27 at £33, Mr. Sampey No. 28 at £34, Mr. Burrows No. 20 at £21 10s., Mr. Cleary No. 1 at £21, and Mr. Daintree, near St. Ives, bought one at £49. This result is undoubtedly fully merited by Mr. Clarke, who has for many years spared neither time nor expense in attempting to bring his flock up to a first-class standard.

Mr. Caswell, of Laughton, obtained the next best average, which was £14 15s. each for 60 shearlings. These were fine sheep, and some of them were of good form and quality. No. 17 was bought by Mr. Caswell of Quadring at £50. Mr. Thorpe bought two at £18 and £20, Mr. Fordham two at £17 and £19, Mr. Checkley two at £17 10s. and £21, Mr. Bird one at £21 10s., Mr. Eve one at £20 10s., and one, No. 24, was bought for Earl Grey at £17 10s.

Mr. Caswell of Pointon ran third, making an average of £14 12s. 6d. each. No. 10 was bought by Mr. Collingwood at £70, No. 11 by Mr. Wallis at £18 10s., No. 13 by Mr. Sisman at £18, No. 20 by Mr. Goodliff at £28, No. 25 by Mr. Loughdale at £18, No. 26 by Mr. Beaton at £22, No. 30 by Mr. T. Tryon at £21, and No. 40 by Mr. Wright of Nocton Heath at £45.

Mr. Thomas Kirkham, of Audleby, near Caistor, had 60 shearlings sold by Mr. Briggs, the average of which we were unable to get, but the following good prices were made; No.

8 was bought by Mr. R. Howard for the Temple Bruer flock, at £46; No. 9 by Mr. Topham, at £28; No. 10 by Mr. Robinson, at £22; No. 31 by Mr. Salter, Attleborough Hall, at £21; No. 51 by Mr. F. Isles, at £23. Mr. Pratt, near Peterborough, also bought three, at £18 10s., £13 10s., and £16 10s. respectively; and one was bought for Earl Grey at £20. Many of these sheep were, as usual, excellent for symmetry and quality.

Mr. Greaves, of Bloxham, had 30 shearlings, which were also sold by Mr. Briggs. Mr. Swain bought No. 1, at £21; Mr. Pringle (a Scotchman) bought No. 9, at £58; Mr. Pogson No. 10, at £26; Mr. Pank No. 11, at £17; and Mr. Frith No. 24, at £21. There were some very useful sheep among this lot.

Mr. Williams, of Carlton-le-Moorland, had 24 shearing and 5 older sheep on the ground, and these were partly offered by Mr. Briggs; but as they came to the ring rather late, and buyers were short, the greater part of them were passed or withdrawn. We were informed that afterwards some of them were disposed of at satisfactory prices. Among them were two enormous 2-shear sheep of fine character, one of which was let to Mr. Topham at £20. There was a deal of fine form and general character about many of these sheep.

Mr. W. Chaplin, of Tathwell, had 16 shearlings offered by Mr. Briggs, but we were unable to obtain the full result.

Mr. Topham, near Rugby, also placed 30 shearlings in Mr. Briggs' hands, who sold them at fair prices. No. 8 we heard sold at £17 10s., and No. 10 at £16 10s. These sheep were very useful for crossing purposes.

Mr. Walesby, near Wragby, brought 21 shearlings; but as the day turned out they came on rather too late, and had not therefore so good a chance as their merits deserved.

Mr. P. Cartwright, of Dunstan Pillar, had 40 very useful shearlings offered by Mr. Mann, and they made fair prices, the leading ones being £14 for No. 24, to Mr. Kingsley; £18 for

No. 16, to Mr. Tarrell; £19 for No. 18, to Mr. Hill; and £37 for No. 15, to Mr. Luster. This flock appears to be rapidly improving under Mr. Cartwright's independent judgment and indomitable energy and perseverance.

Mr. R. Wright, of Nocton Heath, had 36 useful shearlings; but as this was the first appearance at Peterborough, of selections from this flock, and more sheep than buyers being on the ground, the figures realized were not equal to those which Mr. Wright has been in the habit of receiving at the Lincoln fair, which falls next week.

Mr. Burditt, from near Kettering, brought 20 shearlings, but they had too much of the Leicester form and coat to suit Peterborough customers on such a heavy day, and they were taken home again.

Mr. W. Kirkham had 72 offered by Mr. Fox, but they did not make anything more than prices varying from 5 guineas to £9.

Among the other lots were Mr. George Clark's, of Canwick, which numbered 27 shearlings and 5 two-shear; Mr. Wilkes's, of Croxton Kerrial, 25 shearlings; Mr. Hack's, of Buckminster, 32 shearlings, which were leggy, and otherwise not admirable; Mr. Waltham's 24 shearlings; Mr. Fisher's, of Weston, 50 shearlings, which sold from 4 to 6 guineas each. And 20 shearlings of Mr. Cartwright's; but these sheep had been far better prepared for the butcher.

In the market-place, the trade for store lambs and stock ewes was somewhat slower, and lots hung on hand late in the day. The new market-place in course of construction in close proximity to the High-street will be a most advantageous change in the right direction for the improvement of the accommodation in this town on market-days; for what with miscellaneous stalls, stock, and machinery, circulation is almost stopped at times. Messrs. Amies and Barford had their usual extensive show of their own manufactures; in addition to which, as machine agents and dealers, they had selections from the stocks of all the best agricultural engineers.

## SPARKENHOE FARMERS' CLUB.

### MEETING AT LOUGHBOROUGH.

This very prosperous Agricultural Society held its annual show on Wednesday and Thursday, Sept. 6 and 7, at Loughborough, in the park of Mr. Warner, on the Leicester-road. The situation affords a most extensive area, with a good turf and numerous spreading elms and chestnuts, on seats under which the visitors found a pleasant and shady rest. A lofty marquee, capable of accommodating nearly a thousand people, was fixed opposite the hall for the dinner. The society offered nearly £900 in 460 prizes.

The attractiveness of the programme was in no small degree due to the liberality of the people of Loughborough. The visits of the Sparkenhoe Club are sought by many places, and if its committee yielded to the solicitations they receive, it would soon spread the area of its exhibitions over England, instead of being, as at first, limited to a single hundred of the county of Leicester, from which it derives its name. The ground presented a gay appearance during the day; for, whatever may be the views of agriculturists as to the propriety of trimming sheep, the ladies who visited the show did not fail to sport their gayest hues in the bright sunshine.

The shadow of a great threatened calamity, however, hung over the show of stock, and reduced its number greatly, many being deterred from sending their animals from fear of possible contagion, amongst others, the Earl of Howe, the Earl of Aylesford, and Earl Spencer not sending their animals on that account. Last year there were 123 entries of cattle, this year only 74, and of these no less than 24 entries were absent. There were 121 entries of sheep last year, this year only 75; pigs, which were last year 59, fell to 40; horses, from 164 to 127, and poultry from 316 to 201. Though small, however, the show of cattle contained some very fine animals, especially bulls, oxen, and fat cows. A piece of plate or money to the value of £10 offered by Mr. W. Perry Herrick, for the best in the two classes of fat animals, was awarded to Mr. John Lynn, of Church farm, Stoxton, Grantham, which also took first prize of £10 for fat cows. The second prize in the same

class was won by Sir John H. Crewe. Mr. G. F. Mitchell, of Newton Solney, Burton-on-Trent, took the first prize of £10 for fat oxen with a fine shorthorn. A longhorn belonging to Mr. R. H. Chapman, of Upton, Nuneaton, took the second prize. Mr. C. Bosworth, of Dishley, Loughborough, carried off the first prize of £10 for an aged bull, to which was also awarded a £10 cup, given by the inhabitants of Loughborough, for the best store animal. C. W. Packe, Esq., M.P., took the second prize of £5 with another pure shorthorn, bred by himself. Mr. John Ironmonger, of Measham, Atherstone, took the first prize of £10 for a bull under two years old, and Mr. C. Bosworth, of Dishley, the second. The tenant-farmers' classes were not well filled in number, and were only moderate in quality. The shorthorns appear to be gaining ground in this district, judging from the show.

The sheep were the principal feature, though, as a whole, they were scarcely up to the average. The long-wools were a mixture of Leicesters, Lincolns, and Cotwolds, and were a tolerably numerous and good show. Mr. John Lynn took first and second prizes for shearing rams, with good animals of his own breeding, crosses between Leicesters and Lincolns. Mr. Lynn again took a prize with a splendid ram, a cross between a Leicester and a Lincoln. This ram was sold for 200 guineas. Mr. Herrick, of Beaumanor, took first and second prizes for fat wethers; and Mr. C. Bosworth first prize for ewes, and Mr. Herrick for theaves. The long-woolled lambs, for which Mr. Creswell, of Ravenstone, offered two prizes, were a very good class, and were generally commended by the judges. Mr. W. Grewcock, of Barwell Fields, Hinckley, took first and Mr. Herrick the second prize. The long-woolled wether lambs were also a good class, in which Mr. Grewcock was again first and Mr. Herrick (who had another animal commended) second; Mr. M. Woodroffe also received commendation. Mr. C. Bosworth took an extra prize of £1, with two fat ewes of good quality.

The short-woolled sheep were a small show. In the class

for shearing rams the Earl of Aylesford took the second prize, the first not being awarded. Mr. W. Yates, of Grindle House, Shiffnal, took the first prize for short-woolled rams turned two years. It was sold at Colonel Dyott's sale for 31 guineas. Mr. T. W. Yates, of Packington Farm, Lichfield, was the only exhibitor in the class of fat wethers. Mr. T. Oakley, of Normanton-en-le-Heath, near Ashby, took first prize for fat wethers of mixed breed and for theaves; and Mr. J. H. Bradburne, who had no competitor, for a pen of ewes; but there was no competition in the two last classes. Mr. J. H. Bradburne took first prize for a pen of 20 ewes and theaves, receiving also the £5 cup for the best short-woolled sheep. Mr. May, of Elford Park, took the second prize.

The horses were, on the whole, not quite as good a show as we have seen at the Sparkenhoe exhibitions. The prizes were awarded as follows: Mr. W. Briscoe, of Broomsbridge, Loughborough, took the first prize of £10 and the £10 champion prize for the best hunter, with a five-year-old; Mr. Thomas Wallin, of High Oakham, taking the second. Mr. G. Wood, Market Overton, took the first prize for hunting geldings or mares; Mr. W. C. Limbar, of Radbourne, Daventry; Mr. E. J. Bird, of Newton Solney; Mr. J. Bonnett, of Coleorton, Ashby; and Mr. C. Palmer, of Calke, for younger horses. The filly class was very good. Mr. Bailey, of Leicestershire, took the first, and Mr. H. Warner, in whose park the show was held, the second. Lord Berners had a horse highly commended, and Mr. H. Wardle, of Burton, one commended. Mr. Bailey also took the prize for year-olds. Mr. J. G. Led-sam, of Birmingham, was first, and Mr. W. P. Herrick second in the brood-mare class; and Mr. J. Bonnett carried off the prize for hackneys up to 10 years old, and Mr. W. Chapman, of Quorndon, for cobs. In the cart-horses Mr. W. Saunderson, of Cold Overton, took first prize with an entire horse with very good legs and feet, whilst the cup for the best cart-horse was given to Mr. J. Bennett, of Husbands Bosworth, in addition to the first prize in the filly class.

There was a good show of pigs, Mr. Duckering, of Northorpe, carrying away the chief honours.

The implements were, on the whole, a good show, and the exhibitors wisely confined themselves to showing principal articles.

The Champion Ploughing Match was won by Ransomes and Sims, beating two entries of Messrs. Howard's and some local men.

#### PRIZE LIST.—CATTLE.

(By the Society.)—For the best fat ox.—1st prize, £10, Mr. G. J. Mitchell, Newton Solney, Burton-on-Trent.

For the best fat cow or heifer.—1st prize, £10, Mr. John Lynn, Church Farm, Stroxtan, Grantham; 2nd, £5, Sir John H. Crewe, Bart.

(By the Society.)—For the best bull, two years old and upwards.—1st prize, £10, Mr. C. Bosworth, Dishley, Loughborough; 2nd, £5, Mr. W. Packe, M.P.

For the best bull, under two years old.—1st prize, £10, Mr. John Ironmonger, Measham, Atherstone; 2nd, £5, Mr. C. Bosworth.

For the best cow in-milk, having had a live calf since December 1st, 1864.—1st prize, £5, Mr. John Lynn; 2nd, £2, Mr. C. W. Packe, M.P.

(By C. W. Packe, Esq., M.P.)—For the best pair of in-calf heifers, above two and under three years of age.—1st prize, £5, Mr. C. W. Packe, M.P.; 2nd, £3 (by the Society), Mr. C. Bosworth.

For the best pair of stirks, above one and under two years of age.—1st prize, £3, and 2nd, £2, C. W. Packe, Esq., M.P. For the best pair of steers, under three years old.—1st prize, £5, and 2nd, £2, Mr. C. W. Packe, M.P.

(By Sir John H. Crewe, Bart.)—For the best long-horn bull.—1st prize, £5, Mr. R. H. Chapman, Upton, Nuneaton.

(By Sir John H. Crewe, Bart.)—For the best pair of long-horn heifers, in-calf, above two and under three years of age.—1st prize, £5, Mr. R. H. Chapman; 2nd, £2 (by the Society), Mr. E. T. Twycross, Canley, Coventry.

#### TENANT FARMERS' CLASSES.

(By the Society.)—For the best bull, under two years old.—1st prize, £5, Mr. G. Thirby, Remptone, Loughborough; 2nd, Messrs. W. and H. Gill, Burton-on-the-Wolds, Loughborough.

For the best pair of cows, in-milk, having had live calves

since January 1st, 1865.—1st prize, £5, Mr. R. Cayless, Loughborough; 2nd, £2, Messrs. W. and H. Gill.

(By the Society.)—For the best pair of in-calf heifers, under three years old.—1st prize, £3, Mr. M. Woodroffe, Stanford, Loughborough; 2nd, £1, Mr. J. Johnson, Braunstone, Leicester.

For the best pair of stirks, under two years old.—1st prize, £2, Mr. M. Woodroffe; 2nd, £1, Mr. H. Fellows, Hathern.

#### EXTRA STOCK.

Bull, 6 months old, Mr. R. Cayless, Loughborough.

#### SHEEP.—LONGWOOLLED.

(By the Society.)—For the best shearing ram, whether hired or *bona fide* the property of the exhibitor, first prize £5; and second prize, Mr. John Lynn, Church-farm, Stroxtan, Grantham.

For the best ram of any other age, first prize, £5, Mr. John Lynn.

For the best three fat wethers, not exceeding twenty months old, first prize, £3; and second prize, £1, Mr. W. P. Herrick, Beaumanor, Loughborough.

For the best three ewes, having suckled lambs to the 1st of June, 1865, first prize, £3, Mr. C. Bosworth.

For the best three theaves, first prize, £3, Mr. W. P. Herrick.

(By R. W. Cresswell, Esq., Ravenstone, Ashby-de-la-Zouch.)—For the best five long-woolled ewe lambs, first prize, £3, Mr. W. Grewcock; second, £2, Mr. W. P. Herrick.

(By the Society.)—For the best five long-woolled wether lambs, first prize, £2, Mr. W. Grewcock; second, Mr. W. P. Herrick.

(By Mr. C. Stokes.)—For the best fat ewe or wether, of any breed, as extra stock, a premium of £1, Mr. C. Bosworth.

(By the Society.)—For the best pen of twenty long-woolled ewes or theaves (the number of theaves not to exceed one-fourth), the ewes to have suckled lambs up to the 1st of June, 1865, and which are to be put to the ram, and to have been declared as intended to be kept for breeding purposes, first prize, £10, Mr. J. Buckley, Normanton-hill, Loughborough; second, £5, Mr. W. P. Herrick.

#### SHORTWOOLLED SHEEP.

(By the Society.)—For the best shearing ram, first prize, £5, Mr. J. H. Bradburne, Pipe-place, Lichfield.

For the best ram of any other age, ditto, first prize, £5, Mr. W. Yates, Grindle-house, Shiffnal; second, £3, Mr. J. H. Bradburne.

For the best three fat wethers, under twenty months old, first prize, £3, Mr. T. W. Yates, Packington-farm, Lichfield.

For the best three fat wethers, of any mixed breed, under twenty months old, first prize, £3, Mr. T. Oakley, Normanton-en-le-Heath, Ashby-de-la-Zouch.

For the best three short-woolled ewes, having suckled lambs to the 1st of June, 1865, first prize £3, Mr. J. H. Bradburne.

For the best three theaves, first prize, £3, Mr. T. Oakley, Normanton-en-le-Heath.

(By the Society.)—For the best short-woolled wether lambs.—First prize, £2, Mr. Joseph Tebbett, Ravenstone, Ashby-de-la-Zouch.

For the best pen of twenty short-woolled breeding ewes or theaves (the number of theaves not to exceed one-fourth), the ewes to have suckled lambs up to the 1st of June, 1865, and which are to be put to the ram, and to be declared as intended to be kept for breeding purposes. First prize, £10, Mr. J. H. Bradburne, and extra prize, £5, ditto.

#### PIGS.

(By the Society.)—For the best boar of the large breed, first prize, £3, Mr. R. E. Duckering, Northorpe, Kirtan Lindsay; second prize, £1, Mr. R. E. Duckering.

For the best boar of the small breed, first prize, £3, Mr. John Lynn, Church-farm, Stroxtan, Grantham; second, £1, Mr. T. Carroll, Agricultural Colony, Whitwick.

For the best breeding sow of the large breed, first prize, £3, Lord A. St. Maur; second prize, £1, Mr. R. E. Duckering, Northorpe, Kirtan Lindsay.

For the best breeding sow of the small breed, first prize, £3, Mr. M. Woodroffe, Stanford, Loughborough; second, £1, Mr. John Garton, Cotes, Loughborough.

For the best three breeding pigs, of the large breed, of one litter, not exceeding seven months old, second prize, £1, Mr. W. Cross, Kegworth.

For the best ditto, small breed.—First prize, £3, Mr. John Lynn, Church Farm, Stroxtan, Grantham; second, £1, Mr. T. Carroll, Agricultural Colony, Whitwick.

#### HORSES.

(By the Society.)—For the best hunter above four and under ten years of age.—First prize, £10, Mr. W. Brinsco, Broombrigs, Loughborough; second, £5, Mr. T. Wallin, Leigh, Oakham.

(By the Earl of Stamford and Warrington.)—For the best gelding or mare of the hunting kind, not thorough-bred, above three and under seven years old, the property of a tenant-farmer, and having been in his possession twelve months.—First prize, £5, Mr. G. Wood, Market Overton, Oakham.

(By the Right Hon. the Earl of Chesterfield.)—For the best colt, not thorough-bred, above three and under four years of age.—First prize, £5, Mr. W. C. Limber, Radbourne, Daventry.

(By the Earl of Stamford and Warrington.)—For the best filly, not thorough-bred, above three and under four years of age.—First prize £5, Mr. E. J. Bird, Newton Solney, Burton-on-Trent.

(By the Most Noble the Marquis of Hastings.)—For the best colt, not thorough-bred, under three years of age.—First prize, £10, Mr. John Bonnett; second (by the Right Hon. Countess Ferrers), £5, Mr. C. Palmer, Calke, Derby.

(By the Society.)—For the best filly, not thorough-bred, under three years of age.—First prize, £5, Mr. E. Bailey, 52, Highcross-street, Leicester; second (by E. B. Farnham, Esq.), £2, Mr. H. Warner, The Elms, Loughborough.

(By Mr. E. Bailey, Veterinary Surgeon, Leicester.)—For the best yearling colt or filly, by "Kentucky."—First prize, £5, Mr. E. Bailey.

(By Viscount Curzon, M.P.)—For the best brood mare, in-foal, or with a foal at her foot, best adapted for breeding hunters.—First prize, £5, Mr. J. G. Ledham, Griffin's Brook, North Field, Birmingham; second (by E. B. Farnham, Esq.), £3, Mr. W. P. Herriek.

(By H. L. Powys Keck, Esq.)—For the best mare or gelding, above four and under ten years of age, most suitable for saddle and harness purposes.—First prize, £5, Mr. J. Bonnett, Coleorton, Ashby-de-la-Zouch.

(By the Society.)—For the best cob, from four to seven years of age, not exceeding 14½ hands.—First prize, £5, Mr. W. Chapman, Quorndon, Loughborough.

(By the Society.)—For the best entire cart-horse, to travel the district for the season 1866; to stand one night in each week during the season at Loughborough.—First prize, £15, Mr. W. Saunder, Cold Overton, Oakham; bred by the late Mr. Lovett.

(By the Society.)—For the best cart filly, above three and under four years of age.—First prize, £5, Mr. John Bowley, Kingston, Derby.

For the best cart colt, under three years of age.—First prize, £5, Mr. James Hawksworth, Barton Blount, Derby.

For the best cart filly, under three years of age.—First prize, £5, Mr. J. E. Bennett, Husbands Bosworth Grange, Rugby.

(By Mr. C. E. Bosworth, Dishley.)—For the best gelding or filly, under two years of age.—First prize, £2, Mr. John Tyler, Loughborough.

For the best cart mare, in-foal, or with a foal at her foot.—First prize, £5, Mr. W. Saunder, Cold Overton, Oakham.

(By the Society.)—For the best cart foal.—First prize, £2, Mr. Garner, Packington, Ashby-de-la-Zouch.

(By Mr. German and Mr. Stevenson.)—For the best cart foal by their horse "Rantan Robin."—First prize, £3, Mr. John Garner; second, £2, Mr. John Grundy, Packington, Ashby-de-la-Zouch.

(By the Society.)—For the pair of cart-horses (gelding or mares) best adapted for the general purposes of agriculture, and which have been regularly worked to the time of the show, to be shown in Gee-Ho tackle.—First prize, £5, Mr. G. J. Mitchell, Newton Solney, Burton-on-Trent.

#### THE CATTLE DISEASE.

PARIS, Sept. 7.—The following report of the Minister of Agriculture to the Emperor upon the subject of the cattle plague has just appeared:

"Sire,—Since last July England has been suffering from a contagious epizootic disease, which, owing to the proportions it has assumed, is now invested with the character of serious danger. Since I have been aware of this epizootic malady I have requested MM. Bouley and Reynal, two professors at the Imperial Veterinary School at Alfort, to repair, the former to Great Britain, the latter to Germany, to collect all the particulars which could enlighten us upon the nature of the malady, and upon the manner in which it might have been introduced into England. At the same time I desired a special commission to study everything relating to this disease, and to propose the measures which ought to be taken in case French cattle were threatened by the malady. I have now to report to your Majesty the result of the labours of the commission, and to submit to the Emperor's approval the arrangements circumstances appear to me to require. The epizootic disease at present raging in Great Britain is that to which the English have given the name of 'cattle plague,' which the Germans call '*rinderpest*,' and the French '*typhus contagieux du gros bétail*.' Originating in the steppes of Eastern Europe, the contagious typhus of horned beasts never develops itself spontaneously outside those regions, whatever may be the bad hygienic conditions to which herds of cattle may be exposed. This etiological question, now completely cleared up by the investigations of professors of veterinary medicine in Germany and Russia, formed the object of a memoir addressed to my department by the late Inspector-General of Veterinary Schools in France, the learned and regretted M. Renault. In that memoir the difficulties of this problem are treated and solved with a correctness of view and an abundance of proof which leave no doubt whatever upon this point. Con-

tagious typhus of horned cattle is therefore a malady exotic to Western Europe. It can never develop itself there under the influence of general and common causes to which it had been wrongly attributed when its history was less known. The present attack in England is due to the importation into that country of beasts of Russian origin, embarked at the port of Revel, in the Gulf of Finland, and disembarked in the docks of the Thames. But if the cattle plague had only one original country, its eminently contagious properties render it, upon the other hand, an essentially migratory disease. Its history bears witness in very numerous instances to its repeated appearance in Germany, Holland, Belgium, France, Italy, Spain, Egypt, and even in England herself, notwithstanding the privilege of her isolation. In all preceding ages it has been almost invariably in consequence of the movements of the armies of the North that the cattle plague has spread beyond what may be called its native country; for the displacement of the large bodies of men which compose armies necessarily implies a corresponding displacement of large bodies of cattle destined for their provision. In addition to times of war, the cattle plague has sometimes been introduced into the western regions of Europe by commercial channels; but in past times this method of introduction has always been exceptional; and when, owing to the researches of German and Russian veterinary savants, the fact of the endemic nature of this malady in the steppes of the Russian and Hungarian provinces had been decisively ascertained, the Governments of Prussia and Austria have, up to a recent date, been able to take efficacious measures to protect from it those of their provinces in which typhus is not endemic, and through them all the other regions of Europe. In fact, owing to this very active protection, a period of 50 years has passed without typhus having come to visit us, while in the last century this epizootic disease presented itself in our country nearly every twenty years. But the preservative measures employed by Ger-



many only produced their effects because the migrations of the steppe herds were carried on by land routes. Now that the means of communication between different countries have become so rapid and so easy, the chances of typhus overleaping or evading the barriers Germany has hitherto been able to present to its invasion have greatly increased. Thus, for example, in the present instance, its introduction into England has arisen from the fact of speculators in cattle having found it profitable to draw their supplies from the Russian provinces, and to transport them by steamboats to the English markets, which have offered them sufficiently remunerative prices. Germany having thus been turned, and the voyage from the Gulf of Finland to the docks of the Thames having required less time than is necessary for the period of incubation of typhus, it is in this manner that cattle carrying within them the germs of this ruinous malady have been able to be introduced into England, and that country is again subjected, after 120 years, to the disasters the importation of this plague inflicted upon her in 1745. In this state of affairs all efforts ought to be combined to prevent its invasion of our frontiers, and, if it should unfortunately succeed in passing them, to prevent its spread by confining and extinguishing it in the localities first infected. The danger exists. England and Scotland are invaded, and, according to the latest news, the scourge has been imported into Holland by a vessel laden with cattle intended for Great Britain, and returned with her cargo into a Dutch port, not having been able to disembark it in England; no doubt because the inspectors charged with the surveillance of the ports have perceived the diseased state of the animals the Dutch ship attempted to introduce. Whatever may be the reasons which have prevented the debarcation of the cargo, it appears certain that it is by this means the typhus has been imported into the Netherlands, and might just as well have been brought into France if the Dutch ship, repulsed from the ports of England, had been drawn towards one of our ports upon the shore of the Channel by the attraction of a sufficiently remunerative price. It is therefore urgent either absolutely to forbid entry into the ports of the Channel and German Ocean to all vessels laden with cattle of whatever origin, or to subject the introduction of cattle which shall be brought into those ports to such measures as should be necessary to guard against the invasion of the malady, and it is important that similar arrangements should be applied to our northern and eastern frontiers. However, notwithstanding all these precautions, the epizootic malady may any day be introduced into our departments, and the Government must therefore be upon its guard against this eventuality; but it is not necessary to have recourse to new orders for this purpose. The sanitary police, in its relation to domestic animals, is in fact regulated by a series of decrees of the King's Council, of Royal ordinances and clauses of laws promulgated at different periods, and inspired by the necessities of the time, which constitute a complete body of legislation upon the subject. Among these decrees and ordinances are a certain number which have been exactly dictated with a view to combat the epizootic malady by which we are at present threatened. These are the decrees of the King's Council of April 10, 1714; March 24, 1745; July 19, 1746; December 18, 1774; the decree of the Executive Directory of the 27th Messidor in the year V., and the ordinance of the King, of January 27, 1815. These special acts, which are always in force, have foreseen, laid down, and prescribed all the measures necessary to prevent the spread of the evil in the empire: such, for instance, as the obligatory declaration imposed upon the holders of diseased animals, the inspection of the cattle sheds, the slaughter of diseased animals, and of animals of the same species which have been lodged with them, in consideration of an indemnity granted to their owners; the sequestration of diseased or suspected beasts, the designation by a special mark of those which have been momentarily unable to be removed from the places in which they are lodged, the prohibition of fairs and markets, the surveillance of pastures and watering places—all these being measures which, applied with discernment, permit of the restriction of the epizootic malady to such localities, thus preventing the considerable losses its propagation would entail. The experience of past times testifies to the efficacy of these arrangements. The Administration is therefore sufficiently armed to combat typhus at home; but under the present conditions which obtain in foreign commerce it has not the necessary

power to prevent its importation by way of our frontiers; and it is with the object of investing it with this power that I have the honour of submitting the annexed decree to your Majesty's sanction.

"I am, Sir, &c.,

"ARMAND BEHIC, Minister of Agriculture, Commerce, and Public Works."

The decree alluded to above was signed by the Emperor upon the 5th inst. After the usual formalities, it proceeds to order:—

"1. The importation into France of domestic animals, the entrance of which would present dangers of contagious typhus, shall be forbidden, or subordinated to such measures as may be necessary to prevent the invasion of the malady.

"2. Decrees of our Minister of Agriculture, Commerce, and Public Works shall determine the frontiers or portions of frontiers over which the introduction and passage by transit of domestic animals shall be forbidden, and the conditions upon which this introduction and passage shall be authorised."

The Minister of Agriculture has thereupon issued the following orders:—

"1. The introduction into France and the transit of animals of the bovine species, as well as of raw hides and other raw portions of these animals, by way of the ports of the sea-coast, from (and including) Nantes as far Dunkirk, and by the frontiers, upon the north and east from the sea to the Rhine, are absolutely forbidden.

"2. The introduction into France and the transit of animals of the bovine species, as well as of raw hides and other raw portions of these animals, coming from England, Holland, and Belgium, are absolutely prohibited into all the ports and custom-houses of the empire.

"3. In all other ports and custom-houses than those to which clause 1 of these present orders applies, animals of the bovine species imported from any other source than England, Holland, and Belgium, shall be provisionally inspected by special agents. Those which are perceived to be healthy shall be admitted. Those which are found unhealthy shall not be admitted. Those which shall only be suspected, or shall have been lodged with animals found unhealthy, shall be placed under observation for ten days in a sufficiently isolated place, and shall not be admitted until it shall be declared that they do not present any symptom appertaining to contagious typhus."

## A PLEA FOR OWLS.

TO THE EDITOR OF THE TIMES.

SIR,—I have just read in *The Times* of yesterday an account of a wiseacre gamekeeper shooting an owl, and discovering, to his great surprise, that she was carrying off a still greater enemy to his craft, viz., a weasel. I will not enter upon the marvellous story of a hawk being killed by the same barrel, for I have known stranger accidents to happen where a cock and a bull were the victims. I have been a game-preserver all my life, but I never would for a moment listen to a plea for the destruction of owls. If "Velvets" would but exert the commonest investigation of their habits, he would find that long before poor "Margery" takes her nocturnal rambles all his young partridges and pheasants are safe under the bodies of their mothers, and (as I never saw a specimen of the *Bubo gigas* here) hares are very seldom swooped upon by our indefatigable mouser. I think it is the Ettrick Shepherd who says in the *Noctes Ambrosiana*, "Shoot a howlet? I'd as soon shoot my barn cat."

It is to the indiscriminate warfare which is exercised by blockheads trusted with guns against everything that has life that this cruel persecution of one of the most useful and harmless birds in creation must be traced. And I grieve to say that the measured flap of his snowy and silent wings as he skirts the shrubbery, and the dash with which he pounces upon some field-mouse or travelling mole, are becoming a rarer sight every year. Pray speak one word for poor Jenny.

Yours very truly,

SAINT-HILL.

## COMMERCIAL PRINCIPLES APPLIED TO FARMING; OR, AN ANSWER TO THE INQUIRY, HOW MAY THE CAPITAL FOR IMPROVEMENTS BE OBTAINED?

At a meeting of the Wigton Farmer's Club Mr. LAMFORT read the following paper:—

I am not a practical farmer. I make this statement at the outset, not to disarm criticism, but to prevent discussion being diverted by personal considerations from its proper channel. Aware of my deficiencies I shall not involve myself in matters of detail, or venture to give an opinion on controverted points. I shall endeavour to produce authority for my facts, and to show reasons for my conclusions; and I trust, therefore, that my argument may be discussed on its own merits.

I propose in broad terms to define farming, and to describe what I consider to be the essentials of a "practical farmer." Having secured these grounds, I shall compare agricultural operations with those of the manufacturing and other staple branches of our national industry. If I can show that the principles involved in all are essentially identical, I may be allowed to draw the conclusion that all should be guided by the same rules, and be referred to the same standard. If, therefore, it appears that farmers have neglected those principles of business which are essential in other branches of industry, it may be inferred that their absence renders the operations of the farm uncertain—often wasteful, and not seldom unprofitable. And the converse will follow: their intelligent adoption will tend to effect the union of skill with capital—will equalise and increase the profits of the farmer—will stimulate the progress of agriculture, and raise it to the rank of a scientific pursuit—to the benefit of all immediately interested, and to the promotion of the well-being of the nation.

1st. I ask, what is farming? Is it a manufacture—a trade, or is it an occupation or business peculiar to itself?

I adopt the statements of our President (Sir Robt. Briscoe, Bart.)—"Land is a machine through which the farmer passes his capital; you are but as tradesmen or manufacturers; you sell and you buy; you manufacture your goods equally with them, though you select land as your manufactory, because best suited to your rearing and knowledge." This is sound sense, and to the point. The manufacturer works by the application of known mechanical laws. The farmer watches and profits by the ascertained effects of a round of seasons, of variations of temperature, of alternations of soaking rain and of drying winds, and of the ever-acting, insensible influences of chemical affinities. Similar natural laws work in their ceaseless round for the manufacturing chemist—for the calico printer, and for the bleacher and dyer. There are in all these cases distinctions, but no differences. If it be said that the seasonal changes by which the farmer effects his transmutations of increase are fickle, and only to be dealt with by a system of long averages, while the laws of chemistry and machinery are consecutive and calculable—let me instance, in reply, the merchant and shipowner, who carry on their operations under natural changes as sharp in their uncertainty, involving greater risks, and yielding more precarious results than any farming. Talk of the potato rot, and I can point to the cotton famine. Against a cattle epidemic, I can set a strike for wages. A wet autumn is as disastrous for the manufacturer of fancy goods as for the farmer; and the law of supply and demand shows as many distressing ripples on the great waves of transition as local atmospheric variations, which here and there punish a few farmers, while the average of the world is undisturbed.

The farmer, therefore, I maintain, can claim no exemption from the operations of those principles which are applied to other branches of industry. He has no peculiar function. He can set up no wall of separation. He can raise no plea for immunity, but must be weighed in the same balance as all other trades. In one word, farming is essentially a *manufacture*, and one carried on under more than the average of healthful and pleasurable influences.

2nd. Let me ask the question, what constitutes a "practical farmer"?

According to the etymology of the phrase, a practical farmer is a person who practises farming. But such a definition will hardly pass current in this room. A distinction must be made between those who practise farming for pleasure and those who carry it on for profit. And yet what shall we say of Mr. Mechi, for example? He is no mere theorist. What he preaches he practises. A regular system, as far as I can understand it, has for years been carried on at Tiptree. There is as steady a conversion of manure and oilcake into corn and meat on his farm, and with as close an economy, as on any of the best Cumberland farmsteads. No doubt Mr. Mechi is independent of the results of his farming operations, and this independence perhaps marks the best line of distinction. Let us, therefore, consider a "practical farmer" to be a person who farms for his living, and we shall perhaps meet the difficulty. This definition will cut off *dilettanti*, merely amateur dabblers in agriculture. It will enable me to speak of farmers as a class who make farming their trade, and follow it for profit. It will bind them to conduct their business upon true commercial principles, and lay them open to free criticism, while it challenges comparison in management with other branches of our great national industry.

I assume, therefore, that farming is a manufacturing process, and that a practical farmer is a person who engages in this process to gain a livelihood—that he makes it his avowed occupation, and gives up to it his whole time and attention.

I assume, also, that there is no reason why his operations should not be guided by the broad recognised principles of production which make other branches of trade yield a fair amount of profit.

What, then, are those recognised principles? 1st, I instance the important one of *division of labour*; 2nd, the employment of approved mechanical and other appliances for economizing labour and lessening the cost of production; and 3rd, a maximum production from a given fixed outlay.

These several requirements demand an extensive business, ample capital, and a regular system of management. The advantages of *division of labour* are so well known, when applied to the details of all manufactures, that I need not dwell upon them now. My object is to show that they are equally efficacious as respects the general direction of any business.

The question is, can those masters succeed better by carrying on three separate concerns, or by combining to carry on one large one?

It seems to me that the day for small businesses has gone by. Weaving has been gathered into huge mills; and the small manufactories that nestled in the cleughs of Lancashire and Yorkshire, and utilised their scattered water-power, have been absorbed into nuclei, of which Saltaire is a princely example.

I think that the prevalence of partnerships in most businesses proves that extensive operations with division of labour and combined capital are more profitable than the single-handed prosecution of several small ones. It may even be a question as to whether ordinary partnerships and businesses of average extension may now be undergoing supervision by the spread and wider action of Joint Stock Companies.

Several partners attending to different branches of the same business appears to have been much tested and approved in most occupations. The man who has a good head for finance may be little fitted for the mechanical processes of production, while a man whose special aptitude is for the details of the manufactory may be utterly unfit for the operations of the market and exchange. Again, the buying and selling in a large business is as clearly distinct from the finance and book-keeping as from the processes of production. A combination of especial aptitudes, with a union of the capital at each partner's command, appears to effect that organisation which underlies all large and successful businesses.

It is only in large concerns that it is possible to employ steam power and its accompanying host of mechanical con-

trivances by which labour is diminished and time saved. And lastly, it is only by ample capital employed in extensive operations that the maximum production from a given fixed outlay can be attained, and a reduction of all fixed expenses to their minimum effected.

Now, what is the position of agriculture in the face of this great economical bias in all other trades?

Have we, as a rule, large farms—farming partnerships with combined skill, energy, and capital?

Have we the recognised necessity for the employment of approved mechanical appliances, and of a high pressure production? I am afraid not—and why not?

How is it that, in a business like farming, taking in so varied a range of processes—of *tillage*, with its knowledge of soils, manures, and rotations; of *stock feeding*, requiring judgment as to cattle, and intelligent experience as to breeding and feeding; of its general arrangements, demanding skilful direction of labour, and the superintendence of many mechanical processes—how is it that, as a rule, farms are small, and are managed single-handed? If I might do so without offence, I would ask, Are the farmers as a body more intelligent than other commercial men? are they better educated? more specially trained? or more naturally apt to master the details, and carry on the processes of a complicated business?

For an answer to these questions, let us glance at some of the statistics of agriculture.

In 1851 there were 285,936 farm holdings in Great Britain. Of these no less than 170,814, or considerably more than *one-half*, were under 50 acres! The average of the whole number of farms was only 102 acres, while 91,698 farmers, or nearly *one-third* of the entire number, employed no labourers.

The amount of capital employed must always be a doubtful question. M. Laverne, an intelligent French agriculturist, who visited this country in 1854, estimates the farmers' capital in England at £3 7s. per acre. The farmers' profit he estimates at half the rent, or 10 per cent. on the capital invested. Mr. Mechi, in an elaborate paper read before the "London Central Farmers' Club," estimates the farmers' capital at £4 per acre, or a total of £200,000,000, and the acreable produce at £3 12s. The conclusion he draws is "the painful conviction that there must be an immense tract of country unprofitably farmed and insufficiently capitalised."

Now, gentlemen, looking at these statements, may I not safely assume that the commercial principles I have dwelt upon, as being essential to the progress and success of all other trades, are, as a rule, wanting in agriculture? How can an average area of 102 acres give room for an economical division of labour, or employment for expensive but profitable machinery? And how can a capital of £4 per acre so stimulate production as to minimize all the heavy fixed charges upon land in cultivation? While all other branches of industry have been obeying the ascertained necessity for concentration and for high pressure production, I appeal to the inexorable logic of the facts I have adduced, to show that agriculture has resisted the warning and the invitation of the times. At first sight it seems strange that so large a portion of our national industry should be content to be an exception to the general rule of progress and profit; but there seems to me to be an explanation for the anomaly, and it is this: The large farmer finds in his business a social consideration and leisure for amusement which no other occupation of equal extent can yield. On the other hand, the small farmer can find no employment in which his manual labour, with that of his family, along with the small capital he commands, can be so independently engaged. The latter gets his living, and is his own master, and is content. The former gets his living, can meet his landlord in the hunting field; can fish, and shoot, and drive his dog-cart, and finds his solace for a small profit in the consideration and social standing, and in the freedom from anxiety which three times the return and double the capital in other business would not yield.

Take the case, for example, of a farmer holding, say 500 or 600 acres, and say further that his capital is some £4,000 or £5,000, and contrast his position and standing with that of a small manufacturer or tradesman employing a similar capital. The latter, by close attention, will no doubt make twice or thrice the profit that the farmer will; but dare he follow the hounds? or take out his certificate? or take leisure for any sport he is inclined to pursue? What would his neighbours say? Where would his credit be? How soon would he be

sent for into the bank parlour, or find his name in the *Gazette*? No law is so clearly understood as this—that *capital follows confidence*. Confidence and credit are identical, and, until farming is made a purely commercial undertaking, and carried on upon recognized commercial principles, I, for one am not surprised that agriculture should be held to be bare of capital, and that the question should be so frequently asked, Where is the capital for improvement to come from?

Nothing convinces me so clearly of the want of the commercial spirit in farming as the almost entire absence of book-keeping. In every other business worthy of the name, anyone carrying it on without a proper system of books would be regarded as crazy. If he were unfortunate in business, he would on this account be liable to be severely punished in the Bankruptcy Court by his certificate being withheld. By book-keeping I do not mean simple entries of what a man sells, or even a debtor or creditor account kept of his cash. Properly considered, a good system of books is a *registry of results*. By it every variety of crop and every variation of quantity is brought out, ready for comparison on an unvarying common denominator—money. Prize cattle, show-turnips, giant wheat, all the results of fancy cultivation, are reduced to the inexorable standard of this common denominator.

The tissue of loose talk and mere guess-work, by which many a farmer gropes his anxious or whistling his easy way, is resolved by a few columns into hard facts, and measured by a standard unerring and precise. By a proper system of book-keeping alone can any farmer or other producer get a satisfactory answer to the main question of his business, *Will it pay?*

Any practical farmer will tell you *about* what it will cost to plough, to reap, to mow. But general estimates are general delusions. Every man's locality, his manufactory, machinery, and all other concomitant circumstances, differ more or less from another man's; and every man's farm, and every field in it, must also make a difference in the cost of a variety of operations; so that no estimate, except his own experience, ought to be a law to anyone. Now, nothing can make that experience trustworthy and valuable except there be a registry of results; for there can be no reduction of results to a common denominator, except by proper book-keeping. "Many a person will say that if he 'knows his business' (that is, in detail), buys and sells shrewdly—looks, in short, after the pence, 'that the pounds will take care of themselves.' Many a man is satisfied with working away on the faith of stereotyped estimates, or on no estimate at all, depending upon his memory and judgment, which may be defective, if not treacherous, and thinks that if he cultivates his land after the manner of the country round, that he cannot do better. To these persons I will put a single case: Two men have similar farms; but one has a clever managing wife, a steady, hard-working son, and a bright, active daughter: the habit of the other's household is unthrift, pleasure-seeking, and extravagance in dress. The outlay of both households is mixed up with the farm expenditure—all incoming and payment being made out of the traditional old stocking. The one man gradually increases his store: the other is in a state of chronic complaint that 'farming does not pay.' Now, both may be wrong. The satisfied farmer may be making less by his farm than the other, but both are equally in the dark, because neither keeps books."

The first objection to book-keeping will be, no doubt, want of time. Now, whatever else a farmer does, it seems to me that this ought not to be neglected. A man carrying on business without books is like a ship at sea with no compass. But, may I be permitted to suggest that when out-of-door work is impossible, the winter evenings are long and tedious, and that a simple set of books need not take more than an hour a week to enter up? Then, again, allow me to ask whether it is absolutely necessary that a farmer should attend a weekly market. One-sixth of a farmer's time seems to be a large proportion to spend on the road, and in the market-place, to sell a small amount of produce; and I will only point at the temptations otherwise put in his way by this mode of transacting business. To the 91,000 farmers employing no labourers, this market-day cessation of farm-labour amounts to a sacrifice of something like one-sixth of the whole work performed on the farm. Talk of farming not paying! Why, no other business or trade in the country could possibly exist at all under a tax so heavy as this! The infusion of a more thoroughly commercial spirit into agriculture will no doubt effect a change in

this point. It will also, I trust, in time establish a more economical mode of converting the bulk of the farm produce into money. The small farmer confessedly wants capital; but has he ever calculated the loss of interest he incurs by maintaining a well-filled stack-yard? Has he ever made out the per centage of loss to the agricultural interest from the depredations of vermin, or the effect of mildew? I do not venture here to enter into details, but I may state that the admission that steam-threshing is an advantage, will itself dispose of a host of small objections against it. Commercially considered, it appears incomprehensible that while the land is hungering, and the farmer is calling out for capital, a considerable amount of capital is kept worse than idle in the barn and stackyard. Of course, a rapid and general conversion of produce into money would require an increase of middlemen or corn-factors, with their capital, to prevent any great decline of prices. Should such a change become general, as in time I apprehend it must come, its influence on prices will be nullified, as is the case in other articles. Cotton, sugar, tea, flax, and colonial timber are all put into the merchant's hands as quickly as possible, and the course of trade adapts itself to the pressure. Capital in second hands is ready to receive them, and the supply for consumption is regulated by experience and sustained by capital. The first excess is thus impounded as it were, and the stream for consumption is regulated to meet the wants of the year, without unnatural depression in prices. Under the present system it is notorious that the supply of most provincial corn markets is affected by the farmer's convenience or necessities. If he wants money, or has leisure, he thrashes and sells; and if it so happen that several are equally influenced at the same time, prices are forced down without any adequate or general reason. Now, why should farmers double their produce upon the market by a system so serious and costly in expenditure of time, and by so disastrous a locking-up of capital, so much wanted on the land? Many no doubt get advances upon their stacks; but this, as it causes them to pay for the accommodation, ought to realize the loss they incur in holding them month after month. A farmer ought not to be a corn dealer, any more than he ought to be a miller or a baker, unless he possesses ample capital for all (as separate trades), and has some special aptitude or advantage in carrying them on together, which is seldom the case. The farmer's business is to produce corn and meat, and he is the best man of business who concentrates his efforts, and applies all his capital to till his ground and feed his stock.

Before I proceed, let me summarize what has already been advanced.

Farming is a business, similar in its broad features to all other trades or manufactures, and should be managed on the same general principles.

The present condition of agriculture shows, however, that the true commercial spirit is wanting in this branch of our national industry.

This is proved by the average small size of the farms in Great Britain—by the consequent primitive character of the appliances for culture—by a wasteful and expensive general management—by insufficient capital, and a minimum production—by an almost entire absence of systematic book-keeping. The natural consequence of this state of things is a want of confidence amongst capitalists in farming, as a profitable investment.

That "farming does not pay" is a generally received opinion: and from the absence of systematic book-keeping, good farmers cannot prove themselves an exception to the rule. Hence it is that capital is so deficient—that High Farming is the exception—and that agriculture is stationary in the face of a universal progression.

It now follows to determine how the capital for improvements may be obtained? Our president says: "By reducing the size of your farms." This is a clear and intelligible indication how a man may increase the proportion of his capital per acre, and, I think, a plain and practical suggestion how a man may make the amount of capital he now possesses more profitable. But I submit with all deference that no tinkering is thereby afforded as to how a man may increase the amount of his capital available for cultivation, nor does it show from what quarter, or by what process, agriculture is to attract the capital necessary to raise it from a state of imperfect action to one of profitable activity.

Mr. Maschi is to be credited, agriculture, which now vege-

tates upon £4 an acre, requires a sum of £300,000,000 to make it pay. If our President's expedient were to be generally adopted, this branch of industry will require some 80,000 new tenants, possessing or commanding the use of this vast sum. To realize the difficulty of obtaining this large number of new tenants, I may state that even if farming could be put into successful competition with other trades as to profit, it would take every druggist, draper, and bookseller in the country to make up this number, while twenty years of the ordinary increase of population (making due allowance for emigration and drafts to other trades) would not enable the farming class of itself to attain to the requisite dimensions.

These considerations must convince us that it can be no empirical process—by no sudden or violent change—that the whole cause and condition of agriculture can be transposed from apathy to activity, from money starvation to abundance, and from a state of "not paying" to a fair place amongst the profitable staple trades of the country. It will require many and many an answer to the feverish question, Where is the capital to come from? to unravel the mazy web of diverse interests, habits, and requirements. It must be by many and many a process of action and re-action, and by a host of expedients—our President's ingenious and practical, but necessarily narrow one, among the rest—that agriculture will be revolutionized and ultimately built up, as it should be, into the most enduring industrial edifice of our social state.

If what I shall advance, therefore, differs from what our President advised last December, do not suppose that because of that difference there is opposition.

The house cannot be built without the scaffold, and militatives must precede cures; but the gist of the argument and the full measure of the difference may be brought out by the question—Did Sir Robert Brisco say one word against large farms when filled with ample capital?

I therefore proceed with an easy conscience to advocate large farms, as providing, under proper arrangements, what small farms cannot do—namely, the foundation for *division of labour, mechanical appliances, consolidation and increase of capital, and for a profitable high pressure rate of production.*

To bring about slowly, but effectually, this combination of advantages, there seems to me to be one simple recipe—*FARM PARTNERSHIP*; and as most necessary to effect this result—*systematic farm accounts.*

My plan is this: Let two farmers join together, the one to look after the tillage, the other to take charge of the stock, and associate with them a third, with sufficient capital to farm some 600 to 1,000 acres, on the best system. The third may be a sleeping partner; or, say the younger son of a country gentleman, to whom might be assigned the charge of the books, the superintendence of the machinery, or such other special branch of farm business as he may be capable of managing. From the overcrowded state of the profession, such an opening for the younger sons of country gentlemen who might be averse to trade would, I apprehend, be eagerly sought. I can hardly conceive a better position for a young man of good connection than a partnership with one or two clever agriculturists; and I can conceive no more advantageous mode than this by which a couple of clever farmers may find scope for their energy, and utilize their experience and ability to the best advantage. Or, as I have said, the monied partner might be what is termed a sleeping partner, the division of profits being in proportion to the work done, or money supplied. To such a firm of course book-keeping would be essential; and, to a firm so constituted, I conceive no host would refuse such temporary accommodation for legitimate trade purposes, as it might from time to time require.

Although the amount of capital which agriculture is capable of profitably absorbing is something prodigious, amounting—with draining requirements and permanent improvements, in addition to farmers' wants—to something like £300,000,000; yet the capability of the country to produce or supply it is not less prodigious. The amount of surplus profits or interests accruing is generally estimated at annually £80,000,000, while the power of commerce to create its representatives is enormous. I estimate the profits of trade at £300,000,000 annually, representing a capital employed, or turned over, of some £2,000,000,000. Now, if everyone paid his accounts in three-month bills, instead of cash, or, at all events, if three months' extra credit was generally taken over the ordinary period of payment, a sum of £500,000,000 would be at once

available for the purpose of commerce. And this is regularly done to a greater or less extent when money is in demand.

Such a result, however, can only follow, or be supported on confidence. Capital is as mobile, and follows as simple a law, as water in finding its level.

The safest and most profitable business always requires, and will command, the largest share; and I may safely say that no business with these characteristics was ever crippled in its development and operations by the want of capital. It is only businesses that do not pay, and that are carried on in a way that does not command the confidence of the monied class, that are starved and cry out. Once show, therefore, that agriculture is fairly profitable, and establish a fair claim to confidence from its organisation and management, and from a thousand minute and unsuspected sources, and in a thousand ways inscrutable or scarcely traceable, capital will find its way—like water into your deep drains—to fill the empty sides of the farmers, and fructify their half-cultivated fields.

Mr. BAYNE observed that he had long been of opinion that farmers were trading beyond their capital, which in any business was attended by the most unfavourable results. In such cases, they were obliged to forego many advantages which their neighbour had over them who could come with ready money: they were forced to purchase on unfavourable terms, and to forego profits, thereby losing at both ends. They did not go into the best markets and select the best goods; the opportunity arose, as they had bills which must be cleared; and so it went on, a losing game, till at length they broke down, bringing others to ruin in the collapse. The same he applied generally to all trades and businesses as at present carried on, and farmers were not exempt. They had not the capital to do justice to the opportunities of their situation. They could not purchase good animals to improve their stock, nor expensive implements to economize their labour; and it was equally clear that the same cause retarded their applying such nourishment to the land as, under all the blessing, could lead them to expect good crops. The result was failure, and consequent distress and disappointment, with an aggravation of the very evil in which it originated. He had no hesitation in saying that many farmers did produce as much with half the land and proper means and appliances as they did now; and he counselled them, therefore, to increase their profits and circumscribe their area. He agreed with Mr. Lampport that, through the agency of farmers' clubs, partnerships might be formed for farming with advantage, as in commercial speculations; and he also agreed that in all farming operations there should be a strict system of book-keeping, so as to show the profit and loss. He had the pleasure of staying with his friend the late high sheriff of Lancashire, where that system was carried out to the minutest article with eminent success; and he thought Mr. Lampport's paper was pregnant with remark which might be followed up with advantage by the club.

The CHAIRMAN reminded the members that Mr. Lampport started with the admission that he was not a practical farmer, but he was a practical and successful merchant.

Mr. LAMPFORT: I came here, gentlemen, with the full intention of being entirely cut up.

The CHAIRMAN continued: He was glad to find they had a member of that club even bolder than himself. He had himself spoken with less reserve, not that he did not in heart the whole length of Mr. Lampport's conclusions, but because he felt that in that district they were scarcely prepared for such a stride. The question now to consider was, how circumstances were to be dealt with so as to lead to the real improvement. That farming was to be allowed to be subordinate to manufacture was not for a moment to be suggested; for, after all, farmers were nothing but traders, and the man who succeeded the most who was the best judge of feeding and breeding a good animal, and of the mode of producing the soil the best food from which it was to be fed. How could they have heard the remark that such a man was a bad judge of a beast, but he could not manage his land; and again, that though he could manage his land, he knew more about a beast than a man's foot! One man thrives on horses; another ate his head off on cattle; and *vice-versa*. He confessed that in his paper his intellect had said one thing to his feelings had dictated another. He could not bring himself to admit the truth that the time was fast coming when there was no longer the same chance for the hard-

working labourer, who had handled the plough in his youth, occupying as a comfortable farmer in his old age the land he had tilled as a servant when a young man. He had many such amongst the best of the farmers upon his estate at the present moment; and he had felt it too painful an effort to close the door for ever upon all of that worthy class. He had been inclined, therefore, to treat the subject as a palliative; but he was convinced, nevertheless, that large profits, which the extensive farming operations of the present day demanded, were only to be secured by large and powerful combination, with ample capital to work upon. That was the only chance of making an adequate return. The moment two men with capital were united to make a profit, book-keeping must follow; for, without proper book-keeping, there could be no partnership, and no practical working whatever.

Mr. MESSENGER, whom the chairman asked to say something, said he could not, but immediately added that it was admitted that they were all advancing from being low farmers to what was called high farming, and to succeed in high farming they must resort to steam-ploughing, and take advantage of all the newest machinery. In that case they ought to have £7 an acre.

Mr. LAMPFORT said he put it at £10 per acre, and had provided for that by suggesting combination, by which alone it could be secured.

Mr. MESSENGER did not think the Hon. Baronet contemplated steam-ploughing when he limited it to £6.

The CHAIRMAN: No; I took the general class of farming prevalent. But it has been shown that by two or three of the principal farmers joining who understood their business these requirements would follow, and if reduced to a commercial basis, the capital would follow as a matter of course. There might be the practical stock breeder, the practical cultivator of the land, and a sleeping partner with £5,000 who would perhaps be able to look after the machinery and book-keeping. That is the most rational view of the question. Then we shall all cultivate by steam, sooner or later, I have not the least doubt, and those who won't do so will have to walk about their business. The only question now is—how long we are to bear the lash before we confess that we will be good boys for the future.

Mr. MESSENGER: Aye, but where's the money to come from?

Mr. LAMPFORT would for a moment apply to Mr. Messenger the *argumentum ad hominem*. He believed that gentleman was the owner of his own land (he was not aware to what extent), but say to 150 acres. Taking that at a fair valuation it was worth £9,000. He had no doubt Mr. Messenger farmed moderately high, and had a capital of £1,000 to work upon, and that gave in round numbers £10,000. Well, then, his advice would be, if he wished for a larger income, sell the land, take a large farm, and he would make a fortune in ten years. To adopt another plan; let him still sell his land, and buy railway debentures, and then he could make £400 a-year, and more than 10 per cent. upon his floating capital, without any trouble or anxiety, whilst he was sitting at home doing nothing. If ambitious, he must adopt the other course. Farmers who held land were indulging in a luxury others were deprived of, and which the exigencies of the times did not permit. They were holding land that they had no business with. If they did so, they must inevitably do so at a loss, under the circumstances; and if they choose to do so, they had no right to come there and complain that it did not pay as a commercial speculation. They had locked up so many acres from the enterprise of others, and if they wished to be farmers they must not be landowners at the same time—at least without ample capital to cultivate it.

Mr. MESSENGER: Then you would have me adopt Mr. Mechi's plan of dividing my farm till I had what I could manage?

Mr. LAMPFORT said that he quite agreed with both Mr. Mechi and Sir Robert Brisco upon that point, that if they could not get more money upon the acreage it would be better to reduce the acreage and get greater profits by the adoption of a higher system.

The CHAIRMAN observed in reference to steam-cultivation, that if one farmer could not afford to purchase a steam-plough several could combine to do so for joint use, and here the principle of partnership recommended by Mr. Lampport's paper made its appearance at once. All things tended that way till

at length by the union of intelligence and capital the desired change would eventually and gradually be accomplished. They must meet each difficulty as it arose, and anticipate none unnecessarily. He had always found it a golden rule that sufficient for the day was the evil thereof. If they met it as it arose, and let it quietly slide by, that was sufficient. They might depend upon it that no land would ever be permitted to go out of cultivation. At the time of the project of the Manchester and Liverpool Railway, great was the outcry amongst the farmers of the whole district that their occupation would be gone when that fact was realised. But what was the actual result? Instead of horses not being required, there was a greater demand for horses at the two termini alone to take the increasing traffic to that line than the whole of the district was capable of producing.

Mr. LAMPORT asked if any member would state the objection to bringing the contents of the barn in bulk to the market, instead of keeping it idle in the stackyard.

Mr. MESSENGER said that the millers, so far from purchasing their corn in bulk, told them already that they could do without the farmer altogether, so great was the import of foreign corn. Therefore if the farmer took his produce in bulk to the market he would only have to take it home again.

The CHAIRMAN thought if the farmers would show a disposition to bring it in bulk to the market, means would soon be supplied for disposing of it; but of course that would involve the agency of middlemen which Mr. Lamport had spoken of. The difficulty in that district was as to the straw. The moment

they began to let air into the stacks the straw deteriorated, and the farmers were anxious to provide their stock with the best new straw that could be had. Then the grain required time to acquire what was called the "handle," and if it lost that it was depreciated in value, and there was a variety of obstacles in the way of disposing of the crops in bulk.

Mr. LAWSON, M.P., said the valuable paper they had heard that day might be regarded in the light of a supplement to the paper previously issued by Sir Robert; they agreed pretty well on the whole, and the principle advocated in both had received the sanction of that Club, whatever difference of opinion might have arisen amongst the letter-writers. He thought some of the suggestions of Mr. Lamport as to partnership very valuable; and in his own case, the fact had happened that a younger brother had become a partner in the concern, and was a very good farmer. It was not to be supposed that he (Mr. Lawson) was content to be only a "sleeping" partner, for he had looked very narrowly into the working. In farming, they should not forget the advantage and pleasure of living in the country, and enjoying all the beauties of nature, which the commercial man, cooped up in the smoky town, was deprived of. There was, withal, the romance of the thing; and what mattered two or three per cent. more in the return, if all their pleasure were sacrificed in the making of it? His advice was, therefore, if farmers were happy in their occupation, and could make a living by it, let them stick to farming; at the same time, he had not the least objection to any improved method by which it might be made to pay better.

## EXPERIMENTS IN CATTLE FEEDING.

Last spring, Mr. A. Smith, Stevenson Mains, East Lothian, who has given much attention to the fattening and rearing of stock, having a pretty large quantity of potatoes on hand about the time when he was beginning to feed off his cattle, thought of trying how they would thrive on potato diet, with the usual quantity of oilcake. The cattle were accordingly fed off with the potatoes, and thrive so well on them that he resolved on testing the qualities of the root still further this season, by feeding from first to last entirely on potatoes. He at the same time, for his own guidance in carrying out the pulping system, to which he is a convert, made a separate experiment to test its value as against feeding in the ordinary way with sliced turnips. A lot of cross-bred Short-horn stirks, rising two years, were bought by him at the Linton October market last autumn, and divided as equally as possible with regard to condition, size, and so forth, among three courts. The lot numbered twenty, six of which were to be fed on potatoes, seven on pulped turnips, and seven on sliced turnips, with the usual allowance of straw in each case—the pulped-fed cattle getting theirs chopped. From the moment they entered the courts, up to the month of March, when the whole of them for the first time, and in the same proportion, got oilcake and barley-meal to finish off, the cattle were kept exclusively to their own kind of diet.

A very short time served to show which was the most nutritive article of food. Almost from the first the potato-fed cattle took the start of their neighbours, and, to use a racing phrase, were never headed, but came in at the finish a good way in advance of the others. They took to the potatoes with the greatest relish, and never gave the slightest indication of "hoven" all the time they were being fed on them. In fact, no beasts could have given less trouble or anxiety from the day they were put into the close till they were taken out in the early part of May—a period of about seven months. While the experiment was thus satisfactory with regard to what we may call No. 1 court, it was not the less so as respects No. 2—the court containing the cattle fed on pulped turnips. These also, almost from the beginning, evinced a superiority over their neighbours fed on the sliced turnips. They were decidedly in better condition, and brought more money—perhaps the best test of all that they had been better fed. The cattle, as we have said, when they went into the courts, was placed as nearly as possible on an equality, and their difference of condition at the end of the experiment was solely due to

the difference of feeding. The average price obtained for the lot was £17 5s. each. They were sold privately, the value put on them by the purchaser—a dealer of judgment—being as follows: No. 1 court, £17 15s. each; No. 2 court, £17 5s. and No. 3 court, £16 15s. In other words, the potato-fed cattle brought 10s. per head more than those fed in the ordinary way.

The value of the experiment consists, of course, in the expense of raising the different lots, because if No. 3 court were fed off cheaper than No. 1 court, no inducement is offered to make any change from turnips to potatoes. This point can be satisfactorily answered. Each of the courts was supplied with a daily allowance of turnips carefully weighed or measured, and it was found that while in the case of the No. 3 court the seven cattle consumed 11 cwt. of turnips per diem, those in No. 2 court were well and better fed with 9 cwt., or 2 cwt. per day less. This was a direct saving in the cost of the turnips; but it also saved a matter of some consequence, the expense of carting the extra quantity from the fields, which could be much more easily and profitably carted off by sheep as they lay in their drills. As a set-off against this, there is, no doubt, to be placed the cost of the pulping; but this is not a very serious matter. Mr. Smith does not employ steam for the purpose at Stevenson Mains, but has a one-horse power machine, which he finds answers extremely well. The amount of work which it gets through is large, amounting to about 3 tons per hour, amply sufficient for the wants of a pretty large number of cattle we should fancy. There is also the wages of the girl who attends the pulping machine when it is in motion; but making every allowance for these items of expenditure, Mr. Smith is quite convinced from his experience of the system, that it is, when properly conducted, in every way more profitable to pulp than to give cattle the turnips simply sliced. His experiments this year seem to prove that not only can they be fed on a less quantity of turnips, but that they bring a better price when fat than the others.

Taking the value of a ton of turnips at 10s., the average weekly cost of feeding the No. 2 cattle amounted, as nearly as possible, to 4s. 6d. per head, while the No. 3 cost about 1s. per head more. The calculation can easily be made, as will be found as stated. But the potato-fed cattle show a considerably greater saving. The courts were put under the charge of a careful and experienced cattleman, whose instructions were to note down exactly the amounts consumed in

the book which he kept, we find that the only consumed a weekly average of which at 25s. per ton gives 3s. 1½d. feeding each beast, and feeding it with food that costs 2s. 4½d. more be remarked that the potatoes far that the firsts and seconds

had been selected from them, and were only available for the starch mill or for feeding purposes. So satisfied is Mr. Smith with the result of his carefully-conducted experiment in potato-feeding, that he intends continuing it next year on a larger scale. He has no doubt as to its being the most profitable, as it is undoubtedly one of the easiest modes of fattening lean cattle for the market.

## A CONDIMENT FOR CATTLE.

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portions of the body, unless it is given in the food. Now, salt is as necessary for the preservation of the *living body* from diseases as it is for its preservation from putrefaction when dead. Why is it that epidemic disease prevails so much more amongst the humbler classes of society than amongst the rich? Chiefly because the use of salt is neglected in their food. By neglecting this, the fleshy parts of the system are deprived of their due proportion of salt to supply the blood; and the consequence is, the man is rendered liable to the accessions of disease. The bile, the mucus, the saliva, the urine, the gastric juice are in this case all deprived of their due proportion of salt, to furnish that required in the blood, which *must* have its proportion whatever becomes of the other parts of the body.

increase  
farmer grain and  
root crops its use is  
pastures, mixed with lime,  
course grasses, and produce a rich  
with white clover and other succulent  
is during the growth of plants of all kinds  
salts are found in them in the greatest abundance;  
we may therefore conclude that, in the vegetable  
body, it performs in the soil a similar part that it does  
the animal, although in a different manner, helping the  
to its necessary food; or, in other words, it enables it  
assimilate its food, with which also it mixes in a large  
proportion during the time the plant is in a growing state.  
Water is one of the most important of the elementary  
ingredients in the formation of plants. Now, salt, accord-  
ing to Julius Sachs, is found by experiment to have the  
peculiar action on them of retarding the absorption  
of water by the roots, by which the soil is kept in a  
drier state, and a supply of water is secured to  
them. Sachs found that a plant placed in distilled  
water absorbed 175 parts in three days, whilst another  
plant, of the same size, placed in water containing  
one-half per cent. of salt, absorbed only 56 parts in  
the same time. This explains why salt applied to cereal  
crops causes the straw to be shorter and stronger. We  
see the effect of an unrestrained supply of water to cereal  
plants in the length and weakness of the straw and the  
futility of the crop to go down by the first high wind or  
dry storm. Salt is well known to be the best dressing  
to prevent this by shortening and strengthening the  
law.

It is, however, less our intention to show the beneficial  
action of salt upon cereal and other agricultural plants than  
on the animals of the farm, which in this period of exten-  
sive and fatal disease is of most immediate consequence;  
and, although its use in warding off or modifying disease  
of the epidemic kind is well known, its application is still  
so much neglected. The necessity of using salt in food  
of animals of all species is shown by the proportion of it  
found in the blood. In that of the human subject the normal  
proportion of salt is found to be nearly one-half per cent.,  
and in the ashes of blood 57½ per cent. And whether a  
person uses salt in his food or not, this proportion *never*  
varies. It must, therefore, be supplied from the other

Now, what applies to the human subject in this case is  
equally applicable to the farm animals. Their blood has  
its normal proportion of salt, without which the animal  
could not exist; and unless a quantity of salt is mixed  
with its food, the same exhaustion of the supply for the  
other juices of the system will take place, and the animal  
—whether a bullock, a sheep, or a pig—will be more  
liable to the attack of disease, or less likely to recover if  
attacked. We know not whether the veterinary practi-  
tioners have directed the attention of the farmers and  
cowkeepers to this subject, but it certainly is of great im-  
portance at this time, when an unprecedented epidemic  
disorder is decimating the herds and dairies in a fearful  
manner.

That the use of salt in feeding cattle is an exception in  
Great Britain rather than a rule, is well known by the  
dealers in salt, and especially the proprietors and managers  
of salt works. We learn from one of these latter that  
whilst in Germany, France, and Austria the quantity of  
salt given to cattle, &c., amounts to 100,000 tons, in  
England only 10,000 tons is so applied. In Prussia and  
other continental states the use of it is increasing, and in  
Prussia it is said to have increased threefold since 1853.  
Whether the absence of the rinderpest from France and  
Austria is due to the free use of salt for their cattle we  
have no direct means of ascertaining; but it is a question  
well worth inquiring into, how far this has been the case,  
and also whether those of our own farmers and graziers  
who freely use salt for their cattle have been more exempt  
from the visitation than their less careful neighbours.

That the animals themselves are well aware of the use of  
salt, both as a condiment with their food and as a pre-  
ventive of disease, there is every reason to believe. In  
the Pampas of South America, the wild horses, cattle,  
and other graminivorous animals, travel for miles to the  
“*salt licks*,” to supply themselves with the necessary  
proportion to keep them in health. “But,” says a  
prize-essay we have before us, “with our animals the  
case is different; we keep them in either well-enclosed  
fields or tied up in stalls, and they must take such food  
as they find there, or is given to them, whether it contains  
the saline parts so necessary to their well-doing or not;  
and in some measure we increase the evil in stall-feeding  
by drawing out, in warm water, some of the saline  
matters of the food. There is no question that many



diseases our horses, cattle, and sheep are liable to would be prevented if the animals had free access to salt; and where it has been given regularly the beneficial effects have soon shown themselves. In the cellular tissues of the body, in which the flesh and fat are found, as well as in the albumen, there is constantly salt present in large quantities, showing its necessity for the production of both lean meat and fat in animals. The salt acts as a digestive by increasing the saliva, and the animals drinking water with it freely (perhaps one-third more), this additional water helps very much to dissolve

and assimilate those parts of the food which would otherwise pass off undigested, and carries off the noxious humours that show themselves in skin diseases."

We have given this long quotation to show the importance of salt in feeding cattle, and the desirableness of extending its use at this particular crisis, when the whole country is under alarm on account of the rinderpest. We shall now leave our readers to apply these remarks in their practice, which will assuredly be beneficial to the cattle, even if it does not prevent the access of the disease.

## ON THE GROWTH OF FLAX.

We have frequently drawn attention to the growth of flax both at home and abroad, but the renewed experiments to cottonize flax which are making on the other side of the Atlantic induce us to return to the subject, as we have seen some very good samples prepared, although they are yet wanting in the chief elements of ultimate success.

In Egypt flax is sown in December and January, and harvested in April or May, and in Northern Russia it is sown in May and harvested in August, and so it is in the Northern parts of the United States. Flax was one of the necessities of cultivation by the Pilgrim fathers and other immigrants into North America, and by all the new settlers in the wilds of the country for the linen with which their families have been clothed. Up to a recent period almost every thriving New England farmer cultivated a small piece of land in flax every summer, and dressed it out by hand in the barn in the dry, cold days of winter, and the family manufactured it into a variety of articles of domestic use. Indeed, a good many of the old school of farmers did not think they could get along without their tow frock and trousers, nor that anything was so fit for meal-bags as home-made linen. We fully believe that a great many who have abandoned flax culture because cotton was so cheap, may safely, in an economical point of view, return in some degree to the ways of their fathers. It is doubtful whether any other plant can be profitably substituted in any of the Northern States for flax, which can certainly be grown with profit to the grower, for its fibre alone, whenever he can be assured the average price of hemp, and that he may be sure of as soon as some of the recent inventions for separating the fibre and woody tissue have been put into general operation.

The increased culture of flax in North America has been very large, and the prices obtained most remunerative. The recent crops have been probably the best grown for many years. The improvement in flax machinery has been very beneficial to farming interests, preparing a market for the product, and as continued efforts are being made still further to improve, the Americans will be enabled largely to increase its culture. The question, can flax be used as a substitute for cotton profitably? is being extensively discussed in the States, and experiments have been made for several years in order to settle this question. The Rhode Island Society for the Encouragement of Domestic Industry offered a premium for flax cotton "fit for use or machinery," and accompanied with a statement of its culture, production, and preparation, including the cost of the various processes. The committee appointed to examine the flax-cotton

offered for the premium in their report, stated that though none of the competitors were entitled to the premium, yet that the flax prepared by Mr. Stephen Randall's process was in their judgment much more valuable than cotton in all fabrics in which cotton is now mixed with wool, and in some kinds of goods appeared to be desirable as a partial substitute for wool itself.

The legislature of the State of New York, in 1863, appropriated 2,000 dollars for the encouragement of those who were sinking by machinery to test the experiment of manufacturing flax-cotton. The New York State Agricultural Society, to whom was deputed the duty of inquiring into the matter in 1863, co-operated with a committee from the Rhode Island Society. The only competitors were the Lockport Flax Cotton Company and Mr. C. Beart, of Penn Yan. The fibres of flax are uniform in length and diameter, and fusiform in shape, the ends being acutely pointed. It is essential that these characters should be preserved, in order that they may be spun successfully on cotton machinery. The process of Claussen for making flax-cotton, which at one time was in such high favour, failed of success, because he attempted to obtain uniformity in the length of the fibre, by cutting instead of separation: the stumpy ends thus formed were fatal to the success of his enterprise. The fibres of the bast tissue are connected together by a strong adhesive nitrogenous current which has a very strong affinity for them. We believe that all attempts to overcome this connection by mechanical means must necessarily result in failure. Such efforts are as absurd as to extract grease from cloth by mechanical means. The only means of separating them is to dissolve some solvent which has a stronger affinity for the cement than the fibres of the flax. The report of the committee states that neither of these firms have yet produced flax-cotton in such a form as to be spun upon cotton machinery. In the best specimens of the flax cotton submitted particles of spire-wire were found adhering; the fibres were irregular in length and in diameter, and by careful manipulation almost every fibre can be farther divided, which shows that the cement is imperfectly dissolved. The committee state their conviction that the reduction of flax fibre for flax cotton is practicable. Already great strides towards the accomplishment of this has been made in the right direction, and nothing is needed but intelligent and persevering efforts to achieve a triumphant success. The committee, from their investigations, consider that the encouragements for ultimate success are too strong to allow the investigation to rest, and they recommend that at least the sum of 3,000 dollars be offered, so as to practically settle the question.

## THICK AND THIN SOWING.

(TRANSLATED FROM THE "JOURNAL D'AGRICULTURE PRATIQUE.")

Mr. EDITOR.—The observations exchanged between M.M. Selearch and Bodin, in your number of 6th November last, page 484, and those in reply by M. Cerfbeer, inserted in the following number, page 497, have induced me to offer you my own observations—the fruit of many years' experience—upon the practice of sowing in lines, which I consider to be a question of far greater importance than is generally believed.

I must first state that I fully agree with M.M. Selearch and Bodin upon one point, namely, that the quantity of seed must vary according to the degree of fertility the land possesses, and that thin sowing does not succeed so well as thick, upon soils in a mediocre state.

In the article which provoked this debate, M. Bodin said, "That hearing that by sowing enormous quantities of seed the weeds would be choked by the thick crop, he tried the experiment; but the results had taught him a sufficient lesson—that he had gradually diminished the quantity of seed, and that in proportion as he diminished it, the produce had increased."

M. Bodin compared the cultivator who sows thick to those who try to rear two or three times more cattle upon a meagre pasture than they do upon a rich one. According to him sowing thick only increases the evil, and it is better to destroy weeds by second dressing and weeding, than run the risk of choking a crop under the pretence of choking the weeds.

M. Selearch, noticing certain assertions in M. Bodin's statement which appeared to him too positive, has proved very judiciously that thin sowing is not a cause but a consequence of the fertility of a soil, and it is necessary that that fertility precede the use of mechanical sowing. His very practical conclusion is, that the proportion of seed ought always to be in inverse ratio to the state of fertility of the soil, but that that proportion should not exceed a maximum of 250 litres of wheat per hectare for poor lands, nor descend below 90 to 100 litres for rich lands. Upon most points, therefore, M.M. Selearch and Bodin are agreed at heart.

But then M. Cerfbeer interposes by declaring that thick sowing, even on rich lands, may be a good practice; and in support of his opinion he uses an argument which appears unanswerable—that from 350 litres of seed spread over a hectare, he obtained a harvest of from 30 to 40 hectolitres of wheat. M. Cerfbeer found "that in soils and cold climates, where the frost often thins the seed, it is necessary to sow thick; that the spring tillering, upon which the partizans of thin sowing lay so much stress, is frequently hindered by various causes, such as drought, the scorching winds of March, &c."

In another point of view, M. Cerfbeer considers thick sowing as a certain means of preventing weeds from growing, and particularly as a more economical mode of clearing them off than hoeing.

These are the principal points of discussion. I shall first reply to some of M. Cerfbeer's arguments, and then beg your permission, Mr. Editor, to treat the subject in a more general manner.

M. Cerfbeer admits that the strongest objection to thick sowing consists in the weakening of the plants from want of space, and the increased chances of being laid in consequence; but, according to him, this double danger may be prevented, either by topping the wheats which are too thick, or by making sheep pass over it in spring, or by quick harrowing, which destroys the superfluous plants.

I have tried all three methods, and believe I am giving the opinion of most cultivators by affirming that wheats topped, or bitten by sheep, yield but a very inferior crop in grain, and always remain subject to being laid on account of the weakness of the fresh sprouts, which, after topping or pasturing, always develop themselves in a premature and imperfect manner. With regard to the use of the harrows, it sometimes succeeds; but every one knows that it is a dangerous process that cuts up where it ought to leave, and leaves where it ought to destroy; in fact, it is unworthy the notice of a good farmer.

The means advised by Mr. Cerfbeer cannot then remedy the evil, and we shall presently prove that there are other more simple and economical methods.

M. Cerfbeer's theory is, that the richer a soil is the more you may exact from it, and that the quantity of plants it can nourish is proportional to its intrinsic fertility. According to him, 34 hectolitres of wheat sown to the hectare is not too much, and for spring cereals it is necessary even to exceed that proportion.

These figures appear inconceivable to cultivators in the North. It is evident that if all the grains sown thus came up and developed themselves, the plants would be mutually choked; and one of two things must happen—either the crop must ripen, or it must grow weak. We are aware that these agricultural facts may vary in different places, and that it is necessary to form general theories with some reserve; but in an immense majority of cases we believe we are justified in affirming that when cereals are sown very thick before winter, they scarcely ever give an abundant crop of grain. The *marima* products are generally obtained where the plants properly spaced are uninjured, and have been able to form during winter a well-developed collar, from which vigorous tillers sprout in spring.

When the young plants are too close, they shoot up to find space, thus tending to weaken themselves, and form a gigantic stalk in spring. This stalk furnishes the tillers which should start from the collar, and which for want of space and nourishment only forms an ear without grain. Hence, those abortive tillers, which in thick crops form straggling stalks at the bottom of the sheaves, resembling hay more than wheat.

But where plants are suitably distanced, a very different effect is produced. Instead of the stalks growing in winter, the first shoots tend rather to spread themselves over the soil; the collar of each plant, being nourished by its crown of roots, soon throw out a bunch of tillers simultaneously, strengthening and increasing itself. I appeal to the testimony of all those who have observed these facts, feeling assured that they will join with me in saying it is always the crops which have tillered in the most vigorous and equal manner that resist the action of storms most successfully, and yield the best produce.

When each plant produces only female stems, the tillers become abortive, and the isolated stalk is easily beaten down; while, on the contrary, the bunch formed by four or five tillers grouped upon the collar offers a strong resistance to the storm, and what is more, in the Northern regions it is upon the tillers developed early in the spring that we always find the best-filled ears of corn. The efforts of the cultivator should, then, tend to provoke and favour tillering, which is a providential faculty given to gramineous plants, and one which ought not therefore to be hindered.

But M. Cerfbeer has said, with reason, we cannot always reckon upon tillering, as various causes may prevent it. Drought, the scorching March winds, or the action of meteors are particularly unfavourable when the land, beaten down by winter rains, has formed a superficial crust. In such cases second dressings are indispensable, and by means of the Cross-kill roller, which breaks the crust, and the harrow, a bed of dust is soon produced upon the surface of the soil, which counteracts the effect of the drought.

When the bottom of the soil is firm, and the surface well pulverized, vigorous tillers will make their appearance at the first approach of heat, unless the soil is deficient in fertility. We know that if the roots thrown out by the young plant do not meet with the necessary aliments in the soil, they cannot bring to the collar that abundance of sap which causes it to strike out tillers. It follows, therefore, that if the earth be poor it is useless putting an extra quantity of seed in, because we cannot reckon upon the effect of the tillering; but, as M. Bodin has wisely said, it is well to ask ourselves, when we have to do with land in such a condition, whether it is advantageous to cultivate wheat there at all.

Another argument of M. Cerfbeer's is, that thick crops

sometimes give very large yields. We do not deny this positively, but we accept the fact merely as an accident, not as a general rule. In order that the thick crop may escape being laid, certain exceptional atmospheric circumstances are necessary. Then it may be thinned by the winter, or by insects. Besides, in sowing broadcast (and particularly when we sow thick, for it is disastrous to sow thick in lines) it continually happens that a great deal of the grain is lost by being either buried too deep or too shallow, or by being eaten by the birds. As a proof of this fact, if in the spring we count all the healthy plants which remain upon the surface of a square metre sown broadcast, even when 3 hectolitres are put per hectare, generally speaking we shall not find these more than 150 stalks; that is to say, as many as remain at the same time when the field is sown in lines with less than half the seed. When such a reduction takes place, no matter from what cause, we have the advantages of thin sowing though we sowed thick. I have often proved this fact, but I do not pretend to say that it will take place alike upon all soils. Nevertheless, I feel justified in stating as a general rule that in sowing broadcast according to the land and their condition, at least a quarter of the seed is lost, and that the value of that seed would be sufficient to pay for weeding, the expense of which appears to frighten cultivators so much.

For the last twelve years all my cereals have been sown in lines and weeded, and though hand labour is dear in this country, it only costs me upon an average 9 fr. per hectare, and in almost every instance the dressing is sufficient. Twenty years ago we sowed 3 hectolitres upon my farm, and that practice was far from choking the weeds, for they abounded everywhere, particularly amongst spring cereals; but a few years of sowing in lines, with careful weeding, soon destroyed these parasites, which devoured the greater part of my manures.

I had besides upon my farm some fields which were sown even thicker; because, to use a local expression, they eat the seed. They were light soils, subject to shifting, and full of insects. A deep culture, and the frequent use of Crosskill, which I always use after sowing, several times in spring upon light soils, have totally changed the condition of these lands, so that the same proportion of seed distributed over others, being nearly 150 litres per hectare, is at present sufficient, a proportion which I intend gradually to reduce.

Thick sowing has then (M. Cerfbœr has shown this to everybody) the great disadvantage of rendering the crop liable to being laid, or, in other words, compromising the harvest. On the other hand, I deny that it has any good effect in choking weeds, for I see weeds invading whole countries where thick sowing is practised, and where, nevertheless, the wheat fields, particularly spring cereals, resemble draught-boards whose colours vary according to the nature of the weed that predominates. If we add to these disadvantages the loss without compensation of a part of the seed, we shall find abundant reasons for the anathema bestowed by M. Bodin upon thick sowing.

I know well that customs necessarily change with soils, and I have had too much experience in agricultural facts to try to apply the same methods everywhere; though the soils in the North are content with nearly 100 litres of seed per hectare, it is possible that it may be better to put double the quantity into those of the Meurthe. Nevertheless, my reason forbids my admitting the advantage of using 350 litres per hectare, unless, as I said before, the soil devours part of the seed, and even then I would say, rather, that the seed rots because the soil is cold and damp, and it is therefore necessary to change that state by drainage and manure; or that the seed proved abortive, because the soil was subject to drought, in which case it is necessary to use a drill that places the grain in fresh beds; or perhaps the seed is destroyed by insects, and then we have to do with a hollow soil. It will then be necessary to overturn the galleries of the insects by digging them up, and employing energetic means of compression, such as the Crosskill roller.

But I have often heard it said, we cannot sow in lines everywhere, because in some places there are no hands for weeding. In countries where there are absolutely no hands, there is no reply to the remark, though it is difficult in such places to make anything whatever advantageous, with the exception of cattle. In extensive cultures, however, we may use the horse-

hoe (of Garrett or others) which dress cereals well. But it may be seen, by the small expense that attends the manual weeding of cereals in lines, that the operation does not require so many hands, and it is well to know that the weakest hands are sufficient for the purpose.

I fear even that in certain localities we complain too soon of want of hands. We cry aloud that the manufacturers have taken away from agriculture the workmen who are so much needed; but we ought to ask ourselves whether agriculture has done all in its power to retain its population in the country. It is not sufficient to offer labourers work during the summer months only. In order that populations may remain attached to their native soil, it is indispensable that agriculture at combine and arrange its operations in such a manner as to fully occupy their time throughout the year. Now, I ask, is that the general order of things?

I shall support my observations by facts. In the North, where agricultural work is so multiplied in all seasons, the field workers do not desert their native homes. Around us, who inhabit the neighbourhood of Saint Quentin, where cotton labour sometimes threatens to take away all our hands, I have been enabled (thanks to culture in lines) to recover some workmen from the manufactures which invaded us. From the first day of March we employ workers, principally women and children, to weed the autumn cereals; then come those of spring, and the different oleaginous plants and roots, after which we have the hay harvest, and in autumn the plantation of colzas, or pulling up beetroots.

By this means we succeed in drawing to the workshop of the land hands which would otherwise be engaged in producing tissues or embroidery, and the advantage is as great to the workmen as ourselves, for we offer them more regular employment, if not higher wages, besides its being more healthy and invigorating.

The question of thick sowing is, therefore, of far more importance than at first sight it appears, embracing more than one order of thoughts and facts. The discussion which it has produced in the columns of your journal was well timed, and has led to some very useful conclusions.

Having now replied to the chief of M. Cerfbœr's observations, I shall ask your permission to treat in a more general and extensive manner the subject of sowing in lines compared with sowing broadcast, and proving that we make a bad use of mechanical drills by hindering the practice of sowing in lines.

If you think the subject would be interesting to your readers, I shall be happy to treat it more fully in a future article.

Yours, truly, F. GEORGES.

Vice-president of the Comitia of Saint Quentin.

DISPERSION OF LORD WENLOCK'S FARM STOCK AT BOURTON GRANGE, SHROPSHIRE.—This sale took place on Wednesday, Sept. 6, when the well known character of the stock attracted a large company. Subjoined is a statement of the amounts realised:—

	£	s.	d.		£	s.	d.
130 store ewes .....	536	2	6	average	4	2	8
90 yearling ditto.....	402	12	6	"	4	9	6
80 ewe lambs .....	184	15	0	"	2	6	4
4 aged rams .....	54	1	6	"	13	10	6
20 yearling ditto .....	332	17	0	"	18	13	0
28 ram lambs.....	124	10	0	"	4	9	0

By which it will be seen that the selection of 352 sheep from his lordship's flock realised a sum of £1,635 18s. 6d., or about £4 13s. for each animal. The appearance and condition of the sheep called forth remarks of general admiration, and reflected the greatest credit on those by whom they had been superintended. The "Herefords" were disposed of at fair prices. "Star," with her bull calf made £49; "Rose," with her heifer calf, £33; while the others were knocked down at figures varying from £30 to £19. The highest price for draught horses was £34. The auctioneers were Messrs. Neek and Wilson, of Bridgenorth.

## HAY AND STRAW ELEVATORS.

## OLD ENGLISH ELEVATORS.

The proverb, "There is nothing new under the sun," is an oft-told one, and our modern "JACK STRAWS" are no exceptions to this familiar rule; almost the only novelty in their mechanism being the application of steam as a motive power in working them. "Travelling shakers," "hay and straw derricks," "sheaf elevators," "rolling platforms," &c., &c., have been in use from time immemorial, as has already been shown in a former paper. The reader, if he has a mind, may even trace the thread of discovery backwards as far as the Tower of Babel; for the Arabs, according to the account of the practice given by Leyard in his work on Nineveh, follow the same method of raising water from the Tigris and Euphrates to water their lands, that was practised in the days of the Hebrew patriarchs. A skin of water, a sack of corn, or a bundle of any kind of agricultural produce, hooked on to the end of a rope, and hauled up or elevated by means of a bullock yoked to the other end of the rope, the rope passing over a pulley at the top of a pole, is truly a primitive invention of the olden time. Poles, ropes, and rollers formed a very conspicuous part of the mechanical philosophy of the ancient school, and even down to the commencement of the present century tackle of this kind was common in every province of the kingdom. It is not at all surprising that farmers should, at a very early date, have had recourse to stacking their hay and straw by horse-power through the instrumentality of poles and tackle of this kind, in a maritime country like England or Holland, where the shipping interest afforded innumerable examples ready made, as it were, for application.

(1). In the olden time the greater number of our improvements came from the continent of Europe, and amongst the rest the Dutch method of stacking hay by horse power, on the principle of a ship-mast and yard or gaff. A mast or pole is reared and fixed by stay ropes at the side of the stack, upon which a yard or gaff is hoisted to the proper height by means of a rope or two ropes passing over, the former a single pulley, and the latter a double pulley, or two pulleys, fixed near the top of the pole. The yard turns upon the pole by means of a loop or ring on the usual ship plan. At each end of the yard or cross arm a pulley is suspended; over these two pulleys the hauling or traction rope passes, and then under a snatch block, either at the bottom of the pole or at a short distance from it, to the side, passing under the snatch block, the horse is yoked; and the other the bundle of hay or straw is attached. When the bundle is hauled up or elevated to the height of the stack the yard turns round a quadrant of the circle, thereby swinging the bundle on to the stack. By placing the snatch-block at a distance from the bottom of the pole, the horse, in hauling the bundle, also swings it round on to the stack. But under the mechanical condition, the bundle must either slide up a plank or a ladder with a board upon it, or else be guided mechanically by the person below by means of a guide rope. The latter is the better plan of the two, as it enables the person below to pull down the rope for another bundle as soon as the raised one is detached.

(2). In a second plan the standard pole is placed in the center of the stack, and fixed by means of stay ropes as in the first case. Near the top of the pole a pulley is suspended, over which the traction rope works. A planked ladder is fixed against the side of the hay or straw stack, up which the bundles are hauled on to the stack. In some examples the end of the rope, to which the horse is yoked, went under an anchored snatch-block, as in the Dutch plan; in others the horse in charge of the horse sat upon the rope. One of our best and most respectable implement makers recollects seeing upon the rope in this manner when a boy, about fifty years ago, in assisting to stack both hay and straw in the valley of the Trent between Gainsborough and Newark. It is probably the Dutch colony, which settled at an early period in the lower part of this great valley, viz., the Isle of Holme, had brought over their own plan with them, and the result is a more simple and expeditious method of carrying it

out, or of "derricking" hay and straw, as some old farmers and mechanics about Gainsborough and Doncaster technically termed the plan to us recently, than the method which is still practised in Holland. But be this hypothesis as it may, the driver sitting upon the rope merits a special notice, as it illustrates, in a very instructive manner, the principle of the controlling action of a weight to adapt the line of traction to the line of draught of the horse.

(3). In a third case the block or pulley over which the hauling rope works is attached to the rick-cloth, rope, or pole, or to the roof of a Dutch barn. The horizontal pole that carries the rick-cloth is made sufficiently strong to bear the strain upon it, which is equal to twice the draught of the horse. In other respects the details of mechanism are similar to those of the second plan.

(4). The fourth example is a reciprocating endless rope, and the improvement which it involves is evidently to obviate several practical objections to aliding the bundles of hay or straw up a planked ladder, or simply a plank leaning against the side of the stack. Thus a series of ladders, and planks of different lengths were necessary, to meet the requirements of the different heights of the stack. Again, the rope working over the top of the ladder or plank was soon worn out, while the extra friction involved increased the draught, &c. Both these objections were obviated by the reciprocating endless rope, of which there were numerous examples, all less or more different from each other in their details. Two will suffice for illustration, in both of which that portion of the system comprising the endless rope is similar. The first of these will form the fourth general example now under notice, and the second the fifth example. But before noticing either, we shall briefly describe that portion common to both, viz., a reciprocating endless rope.

The difference between a reciprocating endless rope, and an endless rope in the common acceptation of the term, lies in the working of them. In the common case rotary motion is given to one of the pulleys, which gives to the rope a continuous motion; but in the other, the reciprocating case, the two sides are pulled down and up alternately, only half the length of the rope passing over a pulley in one direction. Each pulley has a sufficient length of slack rope for fixing it, the one to the top of the pole, and the other to an anchored pulley or hold-fast below. In both the fourth and fifth cases the pulley over the stack has to be raised as the stack rises, but this is done differently, and this is almost the only difference that distinguishes the one from the other.

In the fourth example there is a pole in the interior of the stack, as in the second example, with a pulley near its top; over this pulley one of the slack ropes of the endless rope passes, the pulley to which it belongs being raised to the proper height, when it is made fast to the pole by means of the loose end. The other slack rope goes under an anchored pulley at a proper distance from the stack, where it is fastened after the two sides of the endless rope are made sufficiently tight. Or the lowermost slack rope may be fixed to a second pole, secured by stay ropes, more especially in stacking hay, as the loaded carts or waggons would then pass in freely between this pole and the stack, the bundling of the hay being performed upon the cart or waggon, or in the field on the old Roman or that of the pack-saddles of this country, mentioned by Ellis and other agricultural writers of the early part of the last century. As the stack rises the pulley over it has to be raised and made fast to the pole higher up. The pulley over the cart or waggon, or near the ground when stacking straw, remains at a uniform height; but when the opposite pulley is raised it requires to be undone, an increase of slack rope below being necessary each time the other one above is being shifted higher. The endless rope is sometimes worked by one hauling rope, but two are preferable, being much more expeditious, the one being attached at the upper pulley, and the other at the lower pulley on the opposite side, the two hauling ropes being thus attached at the two points to

which the bundles are alternately hooked on. The other ends of the hauling ropes either pass under snatch-blocks, as in the first case, or carry the drivers, as in the second.

Straw was usually bundled in the common way by means of slings, as in stacking; but hay was sometimes elevated in nets, in other examples in rude baskets, made partly of rope and partly of wickerwork, and capable of holding from one to two hundredweight at a time.

In working the endless rope by means of two hauling ropes the horse had to be yoked and unyoked to and from each alternately. Thus, when a bundle was hooked on at the lower pulley, the horse was hooked on to the opposite one, whose point of attachment when hauled down to the lower pulley elevated the bundle right over the stack, which was then struck off. The horse was then unhooked from that rope, turned round, and hooked on to the other, during which time a bundle was hooked on the opposite side to the point of attachment, a ring or hook brought down when the horse made another journey outwards, thus elevating the second bundle, and so on the work of elevating or "derricking" would proceed. When only one hauling rope is used, the opposite side of the endless rope has to be hauled down by manual labour.

(5). In the fifth example the upper pulley of the endless rope tackle has, instead of a loose or slack rope, a hook, which is hooked on to a ring on the horizontal pole of the stack guard, used for carrying the rick-cloth, as in the third example, this pole and pulley being raised and lowered in the same way as the pole and rick-cloth are raised and lowered. In other respects this example is similar in its details to the last, the fourth. In one respect, however, it differs from the third, inasmuch as the horizontal or cross-pole must either work up and down upon the two vertical standard poles at the two ends of the hay-stack by means of rings or hoops, as in the old Kentish stack guard, noticed by Marshall, Loudon, &c., or else it must extend somewhat beyond the vertical poles at each end, and be made fast to them by a rope, similar to the manner builders fix their cross-poles to their vertical ones. But here we may observe that the reciprocating endless rope does not require to be made so tight as the common ones, nor is it so liable to get out of working order.

(6). Williamson, in his work on "Agricultural Mechanism" (plate v., p. 111), gives an illustrated description of loading carts or wagons by means of a simple derrick crane, consisting of two poles and a winch, and we believe something of the same kind has been tried in stacking hay and straw. Thus one tells us he once saw a farmer stacking hay by means of a single pole outside the stack, with a pulley and rope, as in the second example. Now in this case the top of the pole or two poles, as in Williams's case, must have had a to-and-fro motion, in order to throw the bundle on to the stack, and to raise it free from the side of the stack, as no planked ladder was used. Emerson, in his work on mechanics, gives an old plan of raising water from a river at the bottom of a deep valley to a farm-house above by means of what sailors call "a traveller" upon a rope made fast at both ends to two posts, one post being at the bottom of the steep incline and the other at the top; and the same plan has been proposed in conversation for stacking hay and straw by horse-power, but we have not met with any actual examples of its having been carried out into practice.

(7). The seventh example is an improvement upon the old ship-mast or "gaff-hoist," and now known in the United States of America, where it is extensively in use, as the "derrick elevator." The improvement upon the Dutch plan consists in making the cross-beam or yard turn upon a pivot on the top of the vertical pole or standard at the side of the stack, and in the giving of it a foot to stand upon, so as to do without stay-ropes. In other respects the details of mechanism and working are similar to those of the old plan, at least in principle.

To the above seven examples a great many varieties might be given, that which distinguishes the latter from the former being chiefly the mode of putting on the ropes, and yoking the horses. With a very little difference in the mode of arranging the tackle, two horses may be employed in each example instead of one, thereby performing nearly double the amount of work in a given time. Thus in the first and seventh plans bundles would be raised at the ends of both arms, which would then have to swing round in a semicircle on to the stack, in-

stead of a quadrant, so that as the one horse would be hauling outwards the other would be returning to the stack. And with very little difference these general data will apply to the other five examples.

About the commencement of the present century the above plans of stacking hay were generally known in most of our hay counties, and a few isolated examples were in operation at a very recent date. In our last paper of this series, under "American Loaders and Stackers," it was shown that "the horse-fork" has superseded the old bundling system in stacking hay, and in one or two examples the same result in the march of improvement has taken place in this country. But the practical reader will readily perceive that the hindrance in hay-harvest is not the pitching of the hay in the stackyard, and that, even if it were, the old method of tying it up in bundles would not much expedite the work. Query, therefore, as many intelligent practical men recently interrogated us in the provinces, when searching for the above methods of the older time, "What is the use of them?" "Get you upon the wagon," said a Yorkshireman, "and I shall take a second, and pitch my load on to the stack in half the time you will bundle yours." In short, we had to take our intelligent practical friends back to a period in the French wars, and in the prosperity of our manufactures, when able-bodied men fit for pitching hay were scarce in our hay districts and with difficulty to be had for money; and to the agriculture of the Romans, who handled all their hay in the field; and to that of pack-saddles in this country, when the hay was carried home on the backs of horses in bundles, &c., when the practical rationale of stacking by horse-power was readily understood. But subsequent to the peace at Waterloo hands have been plentiful, consequently the practice fast got into disuse, so that farmers now are far and far between who know anything practically about it, unless in the immediate neighbourhood of the exceptional individuals who have kept it alive to this day. In America, where wages are high and hands scarce the reverse has been the result, the practice there during the last twenty years having been greatly extended. In this country the progress of steam power is greatly enhancing the value of the old plans, promising at no distant date to carry them into universal use.

#### PAST MECHANISMS AND FUTURE COMBINATIONS.

In concluding this short series of papers, we propose briefly to review the progress farmers have hitherto made, and the line of improvement which present methods of stacking hay and straw indicate for the future. In taking a true meridian of our present position, the field which the eye has to survey retrospectively and prospectively is a very extensive one, the two views being widely different from each other in many respects. Recently, when conversing on the subject with several large farmers of long experience, and whose apprenticeships is not a few cases were served during the last century, we had to go into a lengthy explanation before they could understand the practical rationale of stacking hay by horse power, as their horsemen, they said, "could pitch it more expeditiously from the carts and wagons by forks." But when we took them back to the hay harvest field of the olden time, they at once recollected of the "crooks," "pack-saddles," wooden forks, and tackle with which their forefathers, and not a few of themselves in early life, used to harvest hay. When the "trolley" was first invented, it was doubtless considered a crack improvement by the go-ahead farmers of that day, but "a while-away-time" affair by those who had been accustomed to gallop to the hay-field with half-a-dozen or a dozen of empty packs and crooks, to get them reloaded "in less than no time, so to speak. Marshall, in his Rural Economy, says it was dangerous to meet the boys with the empty pack-horses returning from the hay barn or stack-yard to the field, they galloped at such a thundering pace. And it must also be remembered that at that period a large extent of the hay crop was stacked in the field in which it was grown, for the purpose of being consumed there, in order to manure the land with the droppings of the cattle. In those simple times, our forefathers, on the score of economy and good husbandry, concluded that hay should be consumed in the field where it was grown, in order that *fairplay may be done the land*. In such cases the hay-stack was built in or near the centre of the close, the hay being drawn to the stack by ropes, *aisles*, and "sweeps" of re-

ious kinds from the windrows, not a pack-saddle, trolley, or tri being used. Young, in his Survey of the County of Lincoln, writes rather uncharitably of these old practices in his time, when he says, "Everything in haymaking that I have seen in Lincolnshire is barbarous." And again: "In this act" (between Sutton and Alford) "I saw them drawing hay from all parts of the field to the centre with horses and ropes, in order to form a stack without the trouble of carting. The frame for this work, a plate of which I inserted in my northern Tour, is much superior." The frame here referred to simply a "hay sweep," and we quote the above to show the author's opinion of the march of improvement at the period: wrote.

Looking backwards over the footsteps of progress, the reader will thus perceive that our modern hay-carts are an improvement upon the trolley (a low four-wheel carriage); that the trolley was an improvement upon crooks and pack-saddles; that the hay-sweep was an improvement upon ropes and nets, and (going another step farther back in the march of progress), that carrying hay on the backs of horses was doubtless considered a decided improvement upon the more primitive plan when the sturdy yeoman of old England carried home what he required for winter use upon their own backs in bundles, as poor people in our own day carry it from hedge and ditch sides to where they stack it. The progress of fact, when early seen, is therefore obvious enough, and readable, to the most plodding practical capacity.

The above has reference chiefly to the implements employed in the hayfield. We have next to take our readers to the hay-rick or stack, in order to see the progress that has been made in the work of stacking. Thus we are told, in one of the County Reports to the Board of Agriculture, that the common "stack-rick," or "rick-cloth," such as "Edgington's," is a mechanical equivalent, if we may so speak, of the modern improved Dutch hay-barn. And that our old close hay-barns are old copies of the old Dutch barns. Now, the stack-guards, as the reader is aware, consists of two vertical standard poles, one at each end of the hay-stack, with a horizontal pole extending between them, for carrying the rick-cloth, the whole forming temporary roof to the stack, which is raised and lowered by pulley tackle at each of the vertical poles, according as circumstances require. The modern improved Dutch barn, on the other hand, has a permanent roof of some kind, as of thatch or tile, which is raised and lowered by means of four standard poles, one at each corner of the stack, which for stacks of uniform size as to length and breadth has many things to commend it to attention—things suggestive of future improvement as to permanent stack-roofs.

Again, we must not pass over altogether unnoticed the improvements that have been made during the current century in pitchforks, hay-rakes, tedding-machines, stack-stages, scaffolding, and the like, with the peculiar practices to which such improvements have given rise in times of peace, with a plentiful supply of hands as compared with military times, when harvest hands were scarce; but into details on this head we need not enter farther.

Now, all these elements in the march of mechanism must be fully taken into account before we "hitch on a horse" (using a Yankee phrase) to the end of a rope, so as to stack hay by horse-power. And if this was the practical rule that had to be observed by our forefathers, it was still more so in Holland, where able-bodied hands were more frequently removed from the harvest-field by the demands of war, extensive fisheries, &c., &c., Holland being the country from whence we imported very many of our improvements in every branch of agriculture. Such, then, being the facts of the case, we have only to go back to the hay-harvest of the olden time, to see the rationale of their rise and progress. Thus, in carrying with pack-horses, it would be more expeditious to have the hay in the field ready tied up in bundles, say three bundles to each horse, one on each side, and one above between. If there were twelve horses, they may be divided into three teams of four each, a boy being required to each team, the horses following at each other's tails. During the short interval between the loading of the teams, the hands in the field would tie up into neat strings twelve bundles. Two active men, with women to keep the raking close up, would do the work and swing up the bundles between them, one at a time, on to the pack crooks, as fast as the boy could turn round the horses; when away the team would go at a jog-trot to the hay-barn or stack in the stack-

yard. Arriving at the mow or the stack, there would not be two opinions as to how the bundles ought to be elevated, provided the farmer himself was anything of a mechanical genius, and had the means to get the blocks and tackle to do the work; for at every seaport or shipping place, or canal, or river, the common mode of hoisting would suggest the practical rule to be adopted, more especially amongst our Dutch settlers, who had seen the practice in operation in Holland. Hence, the origin of "derricking hay," as some old farmers in the valley of the Trent about Gainsboro' and Doncaster term the practice of stacking hay by horse-power to this day. In stacking hay in the field the details of practice would be somewhat different at the commencement, as the hay near the stack would be more expeditiously collected by ropes, as seen by Arthur Young, in Lincolnshire, or by "frames or hay-sweeps," as he recommends; but in cases of large fields, or where the hay of several small closes was stacked in one, it would be preferable to bundle it, and carry it to the stack by pack-saddles, as the land could be cleared in less time, while there would be less waste of hay and aftermath.

It will, no doubt, be said that the old practice thus described was the exception, a more slow and slovenly wasteful one being the general rule. This must be granted, for when the hay was carried from the windrows it was put upon the crooks by pitch-forks, and an amount of time spent in loading that would worry to death our reader's patience to hear it told. When carried from the small cocks an attempt was generally made to lift two or three of them bodily into the crooks. But we need hardly tell the practical reader that these same small cocks could have been bundled and loaded in less than half the time.

We have said enough under the last paragraph to show the reader how great an improvement the trolley must have been considered to the general pack-saddle practice; and the modern waggon and hay-cart to the trolley, as the practice of stacking hay in the field was given up, and as hay-rakes and tedding-machines were brought to bear upon the economy of field operations. And we need not inform the practical reader that these improvements all militated against the old practice of derricking hay in bundles by horse-power, unless in examples of very high stacks with a paucity of hands, and also in hilly countries in the absence of roads for wheeled carriages.

The introduction of portable thrashing-machines has had an opposite effect upon straw-stacking apparatus; the thrashing out of large quantities at a time having increased the demand for mechanical means of this kind, so as the better to secure and economise the straw in large stacks. And the application of steam as a prime mover has greatly stimulated the march of improvement in this direction. The stacking of straw is a smotheringly dirty, killing work, often requiring extra wages to get hands to do it in anything like a passable form. In many cases the shapeless stacks and shameful waste of straw are all but indescribable. It is, therefore, rather surprising that so little should have been done between the time of Gladstone's "travelling shaker"—say the one erected for the Earl of Selkirk, in 1809, and that of Cornes's combined shaker and elevator, exhibited at Leek and Northampton in 1846 and 1847. But if progress has been slow during the long interval between these two periods, the same thing cannot be said of the present time, for we are now moving at a Derby-Day-galloping-pace, in almost all directions imaginable that lead to the top of the hill.

Before letting loose the reins of the steam-horse into the future, it will be advisable to examine somewhat more closely our modern elevating mechanisms, English and American, from an elementary point of view. Thus, in the old ship-tackle method of derricking hay in bundles, we have nearly all the elements of the modern American derrick elevators. In both examples the hauling-rope passes over two pulleys on the cross-yard and under a third pulley, below. In both, the bundle rises vertically, and is swung on to the stack by means of the cross-arm turning on the mast or standard pole, or the cross-pole turning with the mast. And the reader who has seen trussed-hay hoisted on board any of our war transports, or on our coasting craft, such as import hay from Holland in dry seasons, as 1826, when large quantities were brought over, will readily perceive that both are close copies of the ship mast-and-yard hoist. In point of fact, it would not be difficult to prove that the old ship-masts and yards with their tackle have been purchased by Dutch and English farmers,

put up, and employed in elevating hay and straw on to the stack.

Again, the problem of self-bundling and discharging apparatus, that is now engaging the pioneering talents of both English and American inventors and patentees, is a very old one. Up to this date, to the best of our knowledge, the problem has been only half-solved, *i. e.*, both parties have succeeded, by mechanism closely similar in principle, of making the bundling apparatus discharge its contents when and where they please upon the stack; and the first example of this kind which we saw reported was an American, a non-patented case, in one of the agricultural periodicals of the United States, which comes to England in exchange for our agricultural papers, and to relatives.

The next elementary mechanism now being improved upon, to which we shall turn attention, is an *inclined plane*, up which hay and straw is being elevated on to the stack. This, in the old ship-tackle examples which we have given, was a plank upon a ladder; as the stack increased in height a longer ladder and plank was required, and so on. Up this inclined plane the bundles of hay and straw were hauled on to the stack. Up this simple inclined plane the American horse pitch-fork works, elevating at the rate of 6 tons an hour, and may now be seen in operation in this country as well as in the United States. For elevating straw from a thrashing-machine the endless rake, American and English formerly noticed, is doubtless an improvement; but when we examine an endless rake and the inclined plane up which it elevates the straw from an elementary point of view, it amounts to so many horse pitch-forks upon two endless chains, sliding the straw up a plank, while the trap-doors in the inclined plane of Tuxford and Son's elevator corresponds to the series of ladders and planks of different lengths to suit the different heights of the stack. In all these examples the elements of progress are palpably manifest.

If we turn to poles and pulley tackle we shall find the footsteps of progress equally visible. Thus we have a reciprocating rope over a fixed pulley, as in the case of the old examples of a pole in the stack, and the modern examples of the American horse-pitchfork, when the pulley is fixed in the roof of the barn or the apex of a triangle over a stack.

We have in the next class a reciprocating rope over a moveable pulley, as in the old example of a "ship-yard hoist;" and in the modern examples of the American horse-pitchforks, where the pulley can be lowered, as when suspended from the

roof of a Dutch barn, or from the cross-pole of the stack-guard, the latter being the only example of the American horse-pitchfork which we have heard of being in use in this country.

Next we have to notice endless ropes, and endless bands over both fixed and moveable pulleys in endless variety, old and new. Luck and Campain in their specifications, 1839, take their copies from steam-plough tackle, *viz.*, a reciprocating rope over a moveable pulley, running off and on upon a winding-drum, or off one winding-drum on to another; but like most successful methods of reducing the proposition of the latter to practice is that of an endless rope as illustrated in Clayton and Shuttlesworth's catalogue, which possesses considerable novelty in its details of construction, evidently not included in the patentee's specification, owing to the prior use and publication of endless rope elevators on the bunding principle.

In the next class of examples to which we shall turn attention, the endless band elevator, toothed or plain, is in itself the inclined plane up which the hay or straw is carried on to the cart, mow, or stack. In this respect it is a totally different mechanism from the fixed inclined plane up which the hay or straw is raised, either by reciprocating or endless rakes and it involves equally different principles. It would be superfluous to go into the details of these differences, as they must be manifest to the reader. It will no doubt be said by some agricultural tyro, that the endless band is not an inclined plane. This may be granted in the sense meant; but what follows? The manifest conclusion that the one is, after all, as different from the other as carrying hay up-hill upon your back is to tossing it up-hill with your feet.

Such are the elements of past progress; for the future appears to be more a question of combination than one of individual parts, and the hint thus given to English inventors is equally applicable to those of our colonies and the United States of America. To those who have thrashing-machines the stacking of the straw by machinery has become a *sine qua non*. In short, every thrashing machine, portable and fixed, must now have an elevator for the stacking of the straw. In England little has yet been done in hay harvest; but after the stack gets above the cart, steam may profitably be employed to work the American horse-pitchfork, or clutch fork, for they have two kinds of them, and if once started at the rate of 6 or 10 tons an hour, economical farmers will naturally ask, *Why not pitch the whole by steam?* ENGINEER.

## EXPERIMENTS IN THE CULTIVATION OF MANGEL WURZEL.

It is purposed in the following paper to give the results of experiments in the cultivation of mangel-wurzel, in the season of 1862, which at this period may not be without some interest to the reader. The soil on which the experiments were conducted is a light sandy loam, resting on the ferruginous sand and sandstone of the lower oolite, variously tinted by the oxide and silicate of iron. The land on which the experiments were made is situated at an elevation of 325 feet. It consisted of about eight acres, and formed one side of a twenty-acre field. The farm is managed on the five-course system; consequently, the preceding crop of 1861 was barley, and that of 1860 wheat, that of 1859 mixed clovers. During the whole of the summer of 1859 the land was grazed by sheep, which had a daily allowance of cake or corn, so that the land was in good condition. As regards manure, the barley in 1861, at seed-time, received a dressing of 3 cwt. per imp. acre of phosphatic manure, specially prepared for this crop; and during the autumn of 1861 the land was thoroughly cultivated twice over with Coleman's cultivator, then harrowed and rolled, and all weeds were carefully collected and burned. It was ploughed up to the depth of ten inches about the middle of December; in this state it remained till the first week of April, when it was crossed with Coleman's seven-tined cultivator, working to the full depth of the plough. It was then cross-ploughed, harrowed, rolled, and thoroughly pulverized, and was reduced to a fine state of tilth by the end of April. The ridges were opened with the double mould-board plough, on the 2nd and

3rd of May, to the width of 27 inches. On the 5th and 6th of May, 20 loads of rich farmyard manure were drawn out and spread in the ridges. This manure was the produce of bullocks eating daily 60lb. of good swede turnips, 4lb. linseed-cake, 6lb. of meal (bean and barley), with about 14lb. of cut chaff, two-thirds straw, to one-third hay. The beasts were tied up in feeding hovels, from which the dung was cleared out daily into an open yard tenanted by young stock eating straw and turnips. Three weeks before it was used, the manure was turned and well watered with the liquid drainings collected in a tank in the yard, the buildings being all spouted. This liquid consisted principally of the urine of the cattle. The farmyard manure was spread in the ridges in the usual way, and over this was sown broadcast specially prepared mangold manure in the proportion of 2½ cwt. to the acre, and the whole was covered in with the double plough. The artificial manure was analysed by a competent chemist with the following results—

Moisture	...	...	...	8.11
Organic matter	...	...	...	25.93
Silica	...	...	...	3.66
Soluble phosphate	...	...	...	20.94
Insoluble phosphate	...	...	...	14.76
Sulphate of lime	...	...	...	26.60
Nitrogen	...	...	...	3.03
(Equal to ammonia	...	...	...	3.97)

This manure costs £7 15s. net cash, delivered at the nearest



railway station. The seed, yellow globe, was steeped for twelve hours in rain water; after which it was put into a sack, where it was kept at a temperature of ninety degrees for three days, when most of it had started. In this state it was sown on the 6th May, in the proportion of 5lbs. to the acre, by means of a two-row turnip-drill, having a seed-box specially made for sowing mangold, and which deposits the seeds from cups instead of the brushes generally used for turnip-sowing. This box is simple and inexpensive, and, if required for turnip-sowing, brushes can be readily substituted. We have tried different methods of sowing, dibbling, and drilling mangold; but for cheapness, regularity, and uniformity of depth—the three great desiderata—we find nothing equal to the system above described. When we committed the seed to the earth, the weather was showery, and the soil in a favourable state; but owing to the moist state of the land, the ridges could not be rolled down till the 15th May, when, notwithstanding the land was much beaten and washed by the recent rain, several plants had made their appearance above ground.

By way of experiment, two ridges in the middle of the plot were sown with seed unsteeped, from the same bulk as in the case just described; this was sown the same day as the other, viz., May 6; but the plants did not make their appearance above ground till the 22nd May. On the 28th, our note-book contains the following entry: "Young plants looking healthy, and grow fast; on the same day began setting out plants." This, in our locality, is generally performed by men, who with a hoe cut the plants out at regular intervals, the blade of the hoe varying in width with the distance the plants are to be left apart; one or two inches are left between each stroke of the hoe. The hoer is followed by a small boy or girl, who singles out the plants, care being taken to leave the strongest and most healthy looking.

The distance from plant to plant should vary from twelve to eighteen inches, according to soil and other circumstances. In our locality, we have proved by repeated experiments that the heaviest crops can be grown on ridges 27 inches wide and 12 inches from plant to plant. We prefer having all our root crops singled by day work, as we generally find the work much better executed, there not being the same inducement to scamp the work that there is when working by the piece, particularly where the labourer is migratory and of unsettled habits. An ordinary hand, with a boy or girl to single the plants, will easily get over half an acre per day in a workmanlike manner; an experienced hand will do considerable more, and will vary in cost from 4s. 6d. to 5s. 6d. per acre, according to the rate of wages in the district. As soon as the young plants make their appearance above ground, we freely use the horse-hoe, stirring the soil, frequently and deeply. Soon after the plants were set out the first time, they were attacked by the mangel-wurzel fly—*Anthomyia betæ*—which has greatly injured our crops for the last two years, and was quite unknown in this neighbourhood previous to 1860. As yet, we have found no means of preventing the ravages of this destructive pest. The fly deposits its eggs on the under-surface of the leaf; the maggots, as soon as they are hatched, eat their way into the middle of the leaf, feeding on the pulpy substance, and destroying its vitality. When a crop is attacked, the leaves soon present a brown and scotched appearance. On the 17th June, they were gone through the second time with the hand-hoe, and all weeds carefully cut out from between the plants; the horse-hoeing was continued at regular intervals of about a week. Being aware of the importance of nitrogen to the mangold crop, on the 21st of June 1 cwt. of nitrate of soda and 2 cwt. of common salt per acre were sown broadcast on four acres, in order to test the efficacy and results of nitrogenous manures on the production of this crop; the weather being showery at the time, was extremely favourable for its application, and, the horse-hoe being immediately used, the manure was all either covered or dissolved. July 23 and 24, the whole of the eight acres were subsoiled between the ridges, twelve inches deep, with Gray's subsoil plough, drawn by three horses. July 24, on two of the four acres where the nitrate of soda and salt were previously applied, we again put on a second dressing of 1 cwt. per acre of nitrate of soda, using the horse-hoe to cover it in as before.

The system we have long pursued of preventing the plant from running to seed is this: As soon as they show any appearance of seeding, a careful man is sent through the crop, who with a sharp knife cuts off all the seed-stems close to

the crown of the root; and, if carefully watched and cut off during the early stages of their growth, little damage is done. We found by our experiment, where the seed was forced, a far greater percentage of the plants showed signs of running to seed than where the seed was sown in the usual way.

We always store our mangold crop between the 20th October and 10th November, according as weather and other circumstances permit. At this season, the days are longer; consequently, more work can be accomplished. There is also less danger from injury by frost than at a later period. The way we have long followed in getting up and storing the crop is to let the work to a trusty man at a fixed price per acre, he finding a number of boys who pull up the bulbs, cutting off the tops and leaves not very close to the crown. The whole of the roots are left on, as we find them keep much better than if trimmed and wounded, causing the bulb to bleed, greatly injuring the quality, and, at the same time, rendering it more subject to decay. The bulbs are thrown four drills or rows together, in the same way as turnips, the man and his gang filling them into the carts when drawn off. The usual price we pay is 2s. 6d. per imperial acre. The work cannot be done by men at less than from 10s. to 13s. per acre. In storing, we always endeavour to draw them as near the place where they are intended to be consumed as circumstances will permit. They are stacked or pitted on some dry spot as well sheltered from the north winds as possible. The heaps are made 6 feet wide at bottom, sloping to a point at an angle of about 45°. They are sometimes covered with straw and a slight covering of earth; but, where straw is plentiful, we greatly prefer that covering only. Our system is to cover with about 2½ feet thick of any short straw or stubble, then thatch neatly down with some good wheat or barley-straw, taking the necessary precautions to secure it from being blown off by wind. In this way, we have for many years stored large quantities with but trifling losses from frost or other causes. Even during the severe winter of 1860-61 our crop had no covering but straw; and from upwards of eighteen acres we had less than a ton of rotten or spoiled roots. Although we have never for the last fifteen years used earth as a covering, we have often seen our neighbours lose great quantities from over-heating in the pits when so covered.

Before storing the crop we carefully took up, topped, cleaned, and weighed a part of each lot—viz., that which received one dressing of nitrate of soda, that which received two, and the lot manured in the usual way. From considerably extensive practice in testing the weight of root crops when growing, we find that the fairest system of ascertaining the true weight is to select an average of the crop. When that is satisfactorily determined, measure forty-six feet, taking a ridge for the line or hypotenuse of a triangle; then take sixty-six feet, or one chain in length. Place each end at the marks before set up on the base line. A man taking the chain exactly by the middle pulls it tight; another man with a sharp spade passes along and divides all the roots where the line touches. The same operation being repeated on the other side gives an area of four square poles. The roots are then got up, cleaned, trimmed, and weighed. They are weighed in quantities of 56lbs., that weight being the same fraction of a ton that 4 poles is of an acre; consequently, each weight of 56lbs. is one ton per acre of crop.

We have found this plan greatly simplify the weighing of all root crops, and prevent many errors and mistakes which frequently creep into the calculations. In measuring one or two poles in the same direction as the rows run, it is often found difficult to know with sufficient certainty to which side some of the roots should belong; so that a small error, when multiplied one hundred and sixty times, may swell to considerable magnitude in the end. On weighing an average, four poles of the two acres which received two dressings of nitrate of soda, the bulbs closely trimmed and cleaned, the produce was 28 tons of bulbs and 8 tons 13 cwt. tops from 18,180 roots. No. 2, which received only one dressing of nitrate of soda, produced 26 tons 12 cwt. 2 qrs. 4lbs. clean bulbs and 7 tons 5 cwt. 1 qr. 12lbs. tops from 18,080 roots; while those that were dressed with farmyard manure and nitro-phosphate produced 22 tons 12 cwt. 16lbs. clean bulbs and 5 tons 11 cwt. 20lbs. tops from 18,020 roots.

The appearance in favour of the double-dressing of nitrate of soda over the farmyard and phosphate manure only, was 5 tons 2 cwt. 3 qrs. 12lbs. bulbs and 3 tons 1 cwt. 3 qrs. 12lbs.

tops, at an extraordinary outlay of 26s. The difference in weight between that which had a double and that with a single dressing was only 1 ton 3 cwt. 1 qr. 24lbs. bulbs, and 1 ton 8 cwt. 3 qrs. tops; while the difference in favour of 1 cwt. nitrate of soda over that which was done in the usual way was 4 tons 1 qr. 16lbs. bulbs, and 1 ton 14 cwt. 20lbs. tops.

The mangold, like the turnip and all other root crops, varies in feeding properties according to soil, climate, manurial effects, and other circumstances under which it is cultivated. According to chemical analysis, it is more valuable for feeding purposes than the common turnip or swede. In practice, during the autumn and early winter months, we consider it inferior in feeding value to good swede turnips; whilst during March and April, and as the season advances, we consider it almost invaluable, not only for feeding, but as food for store stock. We have used it rather extensively for some years, when pulped and mixed with cut straw, and allowed slightly to ferment, in which case chemical changes take place, enabling the animal more easily to assimilate the substance of the food. We have used and found the roots equally valuable for ewes suckling their lambs, and for dairy cows in milk, always producing an increased flow of milk; and when given in conjunction with oats, beans, and other nitrogenous foods, the quality of the secretion is not deteriorated in value. The mangold being originally a native of a warmer climate than that of the United Kingdom, other things being equal, we invariably get our best crops during dry, hot summers. The past

season was therefore unfavourable for the production of heavy crops of this root. Ours was greatly under an average of former years. For the benefit of those who may wish to extend its cultivation to cold districts with a large rainfall, we will state the mean day and night temperature, and also the quantity of rain which fell here during the season of 1882, from April to November inclusive—

	Mean Day.	Mean Night.
April . . . . .	55.66	39.93
May . . . . .	64.67	47.45
June . . . . .	62.23	48.05
July . . . . .	65.04	51.25
August . . . . .	62.02	51.25
September . . . . .	60.96	49.36
October . . . . .	58.04	44.87
November . . . . .	42.76	33.00

#### RAINFALL.

	Mean Inches.
April . . . . .	1.40
May . . . . .	2.96
June . . . . .	2.31
July . . . . .	2.45
August . . . . .	1.61
September . . . . .	2.47
October . . . . .	2.65
November . . . . .	0.77

—*Scottish Farmer.*

G. MURRIE.

### THE TRETHERY TESTIMONIAL.

In the course of last year it was felt by some of Mr. Tretrewy's friends that the general feeling of esteem with which he was regarded ought to find expression in some tangible form, which should at once mark their sense of his honourable character and personal worth, and of the services he had rendered to agriculture; and on the matter being mooted it was heartily taken up, it being justly felt that never was there an instance in which such a tribute to those sterling qualities which commend men to the regard of their fellows was more deserved. After mature consideration, it was resolved that a portrait should form part of the testimonial, in order that future ages, long after he has passed away, may be afforded the opportunity of viewing the lineaments of one now so highly esteemed, and who has trod the path of duty so well. Mr. J. P. Knight, R.A., was the artist selected, and we have no hesitation in saying that he has succeeded in producing a likeness which, whether regarded as a faithful life-like representation of Mr. Tretrewy, or as a splendid work of art, is one of the very finest pictures of the kind ever seen in the county. So highly does the artist himself regard the portrait, that we understand he has expressed a strong wish that it may be sent to the next exhibition of the Royal Academy; and, we are informed, that wish will be complied with. In addition to the portrait, six massive and elaborately chased silver salvers, and a tea and coffee service, also of solid silver, the whole weighing 350 ounces, were purchased out of the subscriptions; one object being that Mr. Tretrewy should be afforded the opportunity of leaving to each of his children a piece of plate which would show to those around them the high estimation in which their father had been held; but, at the same time, this has been left to him entirely as a matter of choice, no stipulation or request upon the point being made. The largest of the salvers bears the following inscription: "Presented, with his portrait by J. P. Knight, R.A., to Mr. Henry Tretrewy, of Grampound, by a large number of landowners, yeomanry, and friends, as a mark of their high esteem, and in grateful acknowledgment of the substantial services he has rendered to agriculture, particularly in his native county of Cornwall. September 12th, 1865."

Tuesday last being the day selected as that on which the presentation of the testimonial should take place, a number of gentlemen were appointed as stewards to carry out the preliminary arrangements for celebrating the event in a becoming manner. A dinner, of course, formed a necessary and im-

portant ingredient in the day's proceedings. As the County Chamber was considered the most suitable room in the town for the presentation and dinner to take place in, and on the Mayor of Truro being applied to, he at once kindly placed at the service of the committee. A few of the gentlemen who had provided themselves with tickets were unable to attend so that not more than 170 sat down. At half-past two o'clock Mr. P. P. Smith, the chairman of the testimonial committee, entered the chamber arm-in-arm with Mr. Tretrewy, and was greeted with enthusiastic and prolonged cheers. Mr. Smith took the chair, and Mr. John Gatley the vice-chair. On the right of the chairman were Mr. Tretrewy, with Messrs. William, Henry, and Alfred Tretrewy sons of Mr. Tretrewy, and some of the chief agriculturists of the county of Cornwall. After the customary loyal toasts had been given,

The CHAIRMAN said: "My Vice-Chairman and gentlemen it is now just twelve months since my friend Mr. John Gatley called on me, and asked me to attend a meeting of agriculturists who were anxious to consider in what manner they could best evince their appreciation of the eminent services which, throughout a long and useful life, had been rendered to agriculture in this county by my friend—my much respected friend—Mr. Tretrewy, of Grampound: services, gentlemen, which had deservedly earned for him the title of 'the farmer's friend.' I most heartily accepted the invitation; but when I found that it was proposed that I should be the chairman of the committee, I urged the selection of some gentleman of greater influence than myself; and it was not until I found that I would be considered churlish in me if I longer refused that I yielded to that which appeared to be the unanimous wish. But who on that occasion could have pictured to me which I now see before me? If I could have realized that I should have shrunk still further from occupying my present position; and when it was proposed that the proceedings should take the form they have done to-day, I again struggled to be released, but I was met by the declaration of the committee that the chairman is expected to do his duty. Gentlemen, I find that the choice which your committee has made will not be ratified by the general voice of this large and influential company ('Yes, yes,' and applause). I fear that my friends Mr. Tretrewy, and his friends, will think that some greater mark than myself should have been entrusted with the gratifying task which has been assigned to me ('No, no'). My explanation, however, is made, and if I can

venture to hope, that it will be satisfactory to you, yet I trust that it will at least meet with the same kind indulgence which personal explanations always receive elsewhere; I mean in the greatest assembly in this country—the British House of Commons. I thank you for that warm and generous cheer, because it gives me encouragement to proceed. But I quite agree with my friend Mr. Wise, that there are men in this country who, although they have never rendered themselves illustrious by their achievements in arms, or famous by their works in art, or by their productions in literature, yet have by the very force of their character drawn themselves out from the ranks of their fellow-men, and become so conspicuous by their good actions, and by their usefulness in their generation, as to call for some lasting memorial of their worth. Such a man is my friend on my right, Mr. Trethewy (loud cheers). Of all the eminent agriculturists in Cornwall, and there are many of them, he has by universal consent been considered to be the greatest living benefactor to the interests of agriculture in his native county (cheers). And, gentlemen, let me say that his reputation is not confined to the county of Cornwall, for it extends to every portion of the kingdom in which agriculture is cultivated as a science (loud cheers). Gentlemen, Mr. Trethewy's career has been one of unblemished honour (cheers). It has been fraught with lessons, with useful lessons, to all of us; for I can never believe that he would have attained his present position if he had not kept steadily before him the maxims of self-reliance and self-help (cheers). You know that Mr. Trethewy is the steward—and the successful steward—of one of the largest properties in this county. For upwards of half a century he has been connected with that property; and when he succeeded to the stewardship, Mr. Hawkins, the owner, was a minor. When that gentleman attained his majority the estate was handed to him, excelled by none in this county for good farming, good tenants, and lasting improvements (Hear, hear). During the time that he had the management of the property, he inspired confidence between landlord and tenant, without which no property can be worked with advantage to the owner or justice to the tenant (Hear, hear). Gentlemen, I need scarcely say that Mr. Hawkins handed back that estate to Mr. Trethewy's management; and I know, from recent personal communication which I have had with that gentleman, that he has not only the most unbounded confidence in Mr. Trethewy as a steward, but he has likewise the highest personal regard for him, and respect for his character (cheers). Gentlemen, Mr. Trethewy has been a distinguished member of all the leading agricultural societies of this kingdom. In the Royal of England, in the Bath and West of England, and in the Royal Cornwall he has been a prominent member and frequent judge; and I know that it has not only been for the sake of the estate under his charge, or for his own personal advantage, but for the sake of the county at large, that he has been a member of these societies, and encouraged by Mr. Hawkins to visit every place from which he thought a single improvement could be obtained (cheers). As a land valuer and referee and umpire Mr. Trethewy has always been greatly sought after; questions of the greatest difficulty and disputes of the nicest description have been constantly submitted to him, and he has lent his aid for the purpose of restoring good-will between neighbours, when the breach appeared beyond all human healing (cheers). From my earliest professional career I have felt the highest respect for him, and I can give you no better illustration of the opinion I entertained for his integrity and honesty, than by referring to a small transaction in which I was personally concerned. On one occasion I was about to become a purchaser of a small property, and I was told that a valuer had been appointed on the other side. I asked who had been selected, and when told that it was Mr. Trethewy, I said I do not want any other, I do not know what his valuation is, but I have every confidence in him, and I am ready to enter into the contract (cheers). But, gentlemen, I will now draw you to a wider range. You know that Mr. Trethewy, by his advice, forethought, and intelligence, has done everything which a man could do to stimulate and encourage the farmers and the agriculturists of this county in the course of remunerative improvement, and this he has done not only by the introduction and encouragement of new manures and new crops, but by introducing improved implements and improved breeds of cattle (cheers). If Mr. Trethewy's talents had been confined to one thing—the good management of Mr. Hawkins' property—we

should not have been here to-day; but it is the accumulation of all his merits which have brought us together on this occasion. Although the outline which I have given is very brief and imperfect, yet I believe you will agree with me that Mr. Trethewy has traced to its sources the spring of agriculture, and though he will pass away from us, yet he will leave his footprints upon the agriculture of Cornwall for all time—(cheers)—and not only in Cornwall, for he has planted two of his sons in two other counties famous for their agriculture—namely, Bedford and Norfolk, where he has made them Goliaths in agriculture (loud applause). I am happy to say, however, that he has one little David in his son William, whom we shall keep among us (cheers and laughter). Gentlemen, is not such a man entitled to some acknowledgment from his native county? You have answered in the affirmative, and never was there a more spontaneous offering (cheers), originated by my friend Mr. John Gatley, seconded by Mr. Bullmore, of Trescobee, adopted by acclamation by a numerous meeting, and ratified by the entire voice of the county (loud cheers). It has been said that farmers are but small subscribers—that they measure their subscriptions by their profits, and these, we know, are very small; but I can tell you that on this occasion—and I have had no other experience of the way in which farmers contribute—they have shown in freely from the very first, and, if needed, would have flowed uninterruptedly to the present time (applause). Gentlemen, you must, I am sure, have often seen on market days the smiling and gratified face of my friend Mr. Gatley, who has taken a deep interest in this matter, standing at the door of the Red Lion Hotel, with the farmers gathered around him and emptying their pockets towards the testimonial, until my friend was compelled to cry out, "Hold, enough: I cannot take any more money" (loud cheers and laughter). Gentlemen, then came the examination of the list, and there was found to be upwards of 500 subscribers, and among the names are some of the most honoured in the county. There are Lord Falmouth, Sir Charles Lemon, Mr. Robartes, Mr. St. Aubyn, Mr. Davey, Mr. Carew, Mr. Gregor, the two Mr. Hawkins, Mr. Ennis Vivian, Mr. Humphry Williams, Mr. William Williams, Mr. John Michael Williams, Mr. Henry Williams, Mr. George Williams, Mr. Bolitho, Mr. William Coulson, Mr. Hendy, Mr. Gully Bonnet, and a long list of others, from the peer down almost to the labourer in his cottage; and among them my friend has found the widow's mite—a widow who, no doubt, remembered that Mr. Trethewy had, by his advice and kindness, rescued a husband, son, or brother from some difficulty during a time of difficulty or distress; but John Gatley said, "No, no; we will not take the widow's mite, but will accept her good will, which will be a blessing upon our work" (cheers). Well, the money was subscribed, but what was to be done with it, amounting as it did to upwards of £400? There was but one feeling, that there should be some lasting memorial of this man, that his lineaments should be handed down to posterity, as an incentive to those who might come after him to pursue a similar useful and upright course (cheers). Gentlemen, we determined to have one of the first artists in England to portray those lineaments, and in this selection I must say that we were greatly assisted by Mr. Hawkins, with whom we communicated on the subject. Mr. Knight, Royal Academician, was chosen, and I must say that he has been eminently successful, because he has not only portrayed the features of Mr. Trethewy, but he has also given us the character of the man (loud cheers). Still, there was a large sum remaining, and what was to be done with that? It was determined, and again we were unanimous, that a service of plate should be presented to Mr. Trethewy with the portrait, in such a form as would enable him, if he pleased—but without in any degree intimating or dictating to the recipient what he was to do with it—to place something hereafter in the hands of every member of his family, to which they could point with just pride to those around them, and say, "See what the county of Cornwall thought of our father" (cheers). Gentlemen, I have said that Mr. Knight has been most successful—judge for yourselves. [At this moment the muslin curtains were drawn aside, and the portrait and the handsome and massive service of plate were exposed to view. The enthusiasm became very great, the entire company rising and cheering most enthusiastically in honour of Mr. Trethewy.] Gentlemen, these enthusiastic cheers tell me that I was right; and now there remains but one pleasing duty for me to perform.

Feebly and imperfectly I know the rest of that duty has been done; but now, sir (turning to Mr. Trethewy), let me in the name of all the subscribers, many of whom are present, and still many more are unavoidably absent—let me present to you this testimonial in the short, simple, but heart-felt words of the inscription “as a mark of our high esteem, and in grateful acknowledgment of the substantial services which you have rendered to agriculture, particularly in this your native county of Cornwall” (loud cheers). One word more, and I have done. It is to add a fervent and heartfelt wish, on my own behalf, as well as on behalf of the company, that long-continued health and life may be preserved to you, for the sake of your family, your friends, and the county you have loved and served so well (loud and prolonged cheering).

MR. TRETHEWY, on rising, was warmly greeted, and he spoke throughout under visible emotion. He said: Mr. Chairman and gentlemen, I think I need scarcely say that I rise with feelings of considerable emotion to thank you most sincerely for what you have been pleased to say of me in this room. I also thank you, gentlemen, from my heart, for the very handsome and costly testimonial which you have presented to me, accompanied as it is by so many expressions of kindness and regard towards me. It is far more than I could ever have expected, and far more than I anticipated when the subject was first proposed. I feel that I am far from deserving of such a valuable testimonial or of the many complimentary things that have been said of me, although I do not scruple to say that I may have been of some service to agricul-

ture (cheers). What I have done, however, though in some measure with the view of benefiting myself, I can say also was in the hope of benefiting others (cheers). Again I must repeat that what has been done has far exceeded my expectations; for I never once thought that the matter would have attained such importance, neither did I expect ever to see such a number of influential gentlemen met together to do me honour as are now assembled. I feel grateful to the clergymen who are present for having spoken of me in such kind terms, and heartily thank them for so doing. The chairman has also referred in too complimentary terms to what I have been the means of doing for agriculture, and for the estate with which I am connected as agent; for I do not know that I have done anything more than my duty, but I trust I have not fallen short in that (cheers). In all disputed cases of valuation where I have been called in, I have always endeavoured to satisfy myself, acting on my own unbiased judgment; and it is gratifying to me now to know that in so acting I have given satisfaction to others (applause). Gentlemen, I cannot follow the chairman through all that he has said, but I know that you will take the will for the deed (cheers). I most heartily thank you again for your great kindness, and particularly for the kind wishes and the kind feeling that have been expressed and shown towards me. (Mr. Trethewy then resumed his seat amid loud cheers.)

Other toasts followed, including “Mrs. Trethewy and her sons,” which was responded to in turn by Messrs. Henry, William, and Alfred Trethewy.—*Abridged from the West Briton.*

## CLAYING FEN LAND.

### RAISING SUBSOIL CLAY BY MACHINERY.

Large areas of our fen soils of irregular depths lie on a substratum of clay, and from time immemorial a portion of this clay has been brought up and spread upon the surface as a highly fertilizing top-dressing. According to the old proverb, “*Lay clay on sand and you buy land*”—a proverb that applies with equal truthfulness to peaty soils and others of a kindred character. Claying has been pursued with a varied success, in the Bedford Level for example, almost ever since it was reclaimed from the ocean. The work is done by laying off the land to be clayed into ridges, and then by digging a trench in the furrow between each two for the purpose of bringing up a sufficiency of clay for the half-ridge right and left. Thus, a deep cut is first made, the black earth thrown to one side, and a sufficiency of clay then brought up for being afterwards spread upon the two half-ridges adjoining. The black earth of the next and every succeeding cut is thrown into the bottom of the last cut, when the bottom clay is again brought up, or the black earth removed from the top of each cut may be shovelled back into the bottom after the clay has been dug up. Details of this kind are determined in practice by the peculiar data of each example, such as the depth of the black earth incumbent on the clay, and the quantity of the latter that is to be brought to the surface. The breadth of the ridges and of the trench between them will, therefore, depend upon the depth of the black earth and quantity or depth of clay to be applied to an acre.

Performed by manual labour the work has ever been considered a galling and dirty one to the workmen employed, owing to the obnoxious gases that are liberated during the removal of the earth, almost suffocating at times when the trenches are narrow and deep. Those engaged at such work are consequently unhealthy and generally short-lived, being often a burden upon the parish during a great period of their lives. It follows that the undertaking is more expensive to the farmer than the high wages required to be paid to the workman, to induce them to enter the trenches and undergo the sacrifice of health involved, indicate, as the extra poor-rates and private charities have all to be added to the long account of outgoings. In short, the work is detested by the employed, and but for the extra benefits gained would not be persevered in by the employer, or sanctioned by a thinking public bound by every tie of duty and interest to advance the cause of sanitary progress.

Some time ago a highly laudable effort was made to do the work of raising the subsoil clay by machinery. In other words, a portable steam engine with digging apparatus was invented and manufactured for removing the black earth, bringing up the clay in any quantity desired, throwing it to either side ready for spreading, and for filling in the black earth removed into the trenches, thus leaving the land ready for tillage. This idea is a noble one, in keeping with the steam-gang times in which we live, and although the machine was not altogether such a complete success as the demands of practice required, we are given to understand that with some further improvements discovered and matured during the experiments made, it nevertheless contained all the elements of a useful working desideratum. It is thought a great pity that it should be allowed to lie any longer rusting at Little Port, in the Isle of Ely, where it may be seen by any engineer, landowner, or farmer interested in such improvements. Although we have several times of late passed along that line by railway, and were also more recently on foot in the neighbourhood—(Ely, Little Downham, and March)—and were hardly pressed to go back to examine the machine, &c., our obligations prevented us from doing so. But we promised to discuss the subject *de novo*, in a more comprehensive sense than the Little Port claying machine embraces. This promise we now fulfil. We regret to say, however, that we have not since then found an opportunity of going back to Little Port for the purpose of examining the machine that is lying there, consequently we can neither do it or its inventor justice (whose name is so illegibly entered in our note book that we cannot decipher it to our readers, unless it be *Mr. Savage*?). To avoid any mistake on this head, we have taken the liberty of technically terming it, for the sake of brevity, as above, *The Little Port Machine*.

In canvassing the subject from an elementary point of view, which is all that can legitimately be proposed, we have first to observe, that in some examples the clay may be brought from the adjoining elevated grounds more cheaply by a temporary railway system than by steam machinery from the bottom. The former proposition will be discussed in our second part on this subject, and the latter in this.

Machinery for raising clay may be constructed on three principles:—First, a portable or traction engine working on a temporary line of railway; second, a portable machine travelling over the ground, carrying its own endless railway; and third, a common traction engine at the headland actuating the

claying machine on what has been termed the "rigger principle," the claying machine either carrying its own railway or else working upon a temporary one as in the first and second examples.

The reader will perceive that in the above three plans the common elementary principle of a railway is involved in each. When Archimedes proposed turning the "big globe itself," which we inhabit, out of its orbit by means of a lever or system of levers, the first elementary principle required in the solution of his problem was a fulcrum for his machine; and this is exactly what the fen farmer requires when he proposes to enter his fields with a claying machine; for fen land, even in the dry months of summer, does not furnish sufficient fulcrage for such machinery. We are not certain, but we rather suspect that one of the cardinal shortcomings of the Little Port machine is the want of a fulcrum of sufficient stability to work upon. We know that the contrary opinion prevails, and that to a large extent it is acted upon at the present time in the construction of traction engines, viz., that the diameter and breadth of the wheel may be increased so as to find a suitable fulcrum on any soil; and further, that this was proposed for the Little Port machine itself. But the opinion is fallacious both in principle and practice; and although it is always prudent to allow implement makers and practical mechanicians generally to ride their own hobby horses as long as they can, this same popular opinion is already beginning to lose favour in the estimation of the more intelligent and better-educated portion of the agricultural public, among whom we may instance several of the large fen farmers we met with in the neighbourhood of Little Port; for, granting the soundness or rather practicability of the popular opinion in the continuous locomotion of ordinary traction engines, they see that the intermittent locomotion involved in the example in question would deprive the engine of its momentum in the first place, while, in the second place, the machine in working would sink the wheels when stationary into the soft bottom so as to render farther advance impracticable.

1. *A Temporary Railway Fulcrum.*—On each side of the trench to be opened by the excavating apparatus a line of short sleepers may be laid, and, on these, broad rails for the broad wheels of the engine to travel upon. The length of the rails may be equal to the length of the earth to be excavated at a time, so that when one cut is finished, the engine would move another length forward, when the two rails, and two rows of sleepers behind, would be removed to the front by manual labour. At the headlands, the machine may be turned into a fresh trench on one of several ways, as broad circular rails, a temporary turn-table at each headland, a temporary turn-table jack carried by the engine, &c. This is, perhaps, not the more promising plan, but it has its advantages as well as its disadvantages.

2. *Endless Railway Fulcrum.*—Two plans of this kind have been proposed, patented, and successfully reduced to practice; the one by Heathcoat, patent No. 6,267, 1832; and the other by Boydell, patent No. 431, 1854. The former consists of the sleepers and rails being so constructed as to form an endless flexible railway passing under and over the wheels of the locomotive, so that in travelling, or actuating any external machinery at either side, it works in the interior of this endless railroad, which "affords a broad extended surface for the purpose of sustaining a carriage of great weight upon soft, swampy, boggy, or unstable land." It was successfully used in reclaiming mossy land. The latter consists of a series of sleepers or short rails placed longitudinally upon each wheel, and is too well known to require further description.

For a claying machine, Heathcoat's endless railway would have to be constructed on a different plan from that which was used for the steam ploughing of Chatt moss, and other peaty grounds. Instead of the sleepers extending the whole length of the locomotive, for example, there would require to be an open space longitudinally up the middle the breadth of the trench, to permit of the working of the excavating apparatus. If we therefore assume that the engine has six wheels, two in front, the one following the other, and two on each side behind, the one following the other, then each wheel would have double fellows, and each two wheels would form a set, carrying their own endless railway, so that in the system the engine would be borne on three endless railways, one in front, and two behind, one on each side of the trench. The endless railways may be of any breadth which the softest condition of the

soil required; probably three feet would be sufficient, and between each two wheels there may be friction rollers, for keeping the endless rails down to the ground; but into minute details of this kind our space will not permit us to go further.

In Boydell's wheels, the only alteration required from those now in use would be an increase of bearing surface. In other words, the wheels would require to be increased in diameter, in order to carry longer and broader rails or shoes. An increase of breadth, it is true, may be effected without an increase of the wheel, and this, in some cases, may afford a sufficient extent of bearing surface.

3. *A Common Portable Engine, situated on the Headland, working an Excavating Machine by means of Tackle on the Rigger principle.*—An excavating machine could easily be worked up and down the land by means of an anchored rope and rigger tackle, in a frame or carriage borne on Boydell's wheels, and the whole could be constructed at no great additional expense to those who are already in possession of a traction engine and a Fisker steam plough. Fen lands are generally of great length; but by running the engine along both headlands, and also across the middle of the field, it would be reduced to one-fourth, or to four working lengths. In short, the largest field can easily be reduced to any given length of rigger-working ropes which the circumstances of the case may require. Into the elementary principles of the peculiar mechanism required, the difference between their details and those of Fisker's steam plough, with which our readers are doubtless all familiar, are so small as to render it unnecessary to say anything further on this head; what we have already said, relative to the wheels of the steam engine when travelling over the ground, being applicable to those of the carriage of the excavating machine when actuated by a stationary engine and rigger tackle.

Of the elementary principles on which the excavating apparatus may be constructed, we might quote the long list of patents which have been specified for work of a similar kind, were we certain that our reader's patience would bear to be stretched to such a length. Spades and ploughs, and Jacob's ladders, endless bands and dredging apparatus, mechanical Talpas and Archimedian screws, gunpowder and electricity, are all included in the patented discoveries of the past; and to this long nondescript category an equal number may safely be added of unpatented inventions. Something will depend upon the nature of the soil, subsoil, and how the work is to be done, such as the length of a trench that will remain open at a time without the sides falling in, to mar the successful working of the machinery. No doubt the sides can be planked, to prevent their falling in, but such will be experienced serious obstructions to the successful working of the excavating and elevating machinery. The safer and more advisable course is short cuts at a time, each cut being of no greater length than will stand open to whatever depth it has to be sunk; and for this, no general rule can be given that would be applicable to all cases, one subsoil requiring one length, and another subsoil a different length. Every district must, therefore, be left to determine its own length of open trench from which the black earth above the clay has to be removed at a time, in order to permit of the latter being brought to the surface. But the principle upon which the twofold work—the removal of the black earth, and the removal of the clay—is to be performed is manifestly determined, viz., a short cut, and the filling of the open trench close up behind with black earth removed sufficiently close as to keep out the sides.

To this liability of the sides of the trenches to fall in there may be many exceptions; but in the construction of machinery, the safe and sound course is always to make provision for the worst; and this peculiarity, in a great measure, determines the principles of mechanism upon which the excavating apparatus should be constructed. More practically speaking, the black earth in the opening of the first cut has to be thrown upon the surface; but in the second and successive cuts, if of considerable depth, it may be thrown into the open cut behind, so that the machine must be capable of doing both works, either the one or the other, as the depth may require. The clay, on the other hand, has always to be raised to the surface, and thrown the one half to the right, and the other half to the left side. The principles of mechanism, therefore, are longitudinal excavating and elevating apparatus, and transverse delivering apparatus. This latter apparatus may easily be made to deliver first the black earth, the half to the right side, and the

other half to the left; and, second, the clay over the black earth, the half to the one side, and the other half to the other side. In construction it may be a plain "traveller band," with a reverse rotary and longitudinal reciprocating action. The black earth and clay may be loosened and elevated in several ways. The common dredging machine, with very little modification, may be quoted as an example. As the clay is liable to adhere to all implements of this class, as it does to a spade in digging, water will require to be used, to keep the cutting edges clean. But into details of this kind we cannot go further at present.

### RAILWAY SYSTEM.

In examples where proprietors have an abundant supply of clay upon their own lands adjoining their fens, the practical question naturally arises for solution, Can a temporary railway of a portable character, such as Crosskill's, be laid down for the purpose of carrying the clay from the adjoining elevated grounds? And can fen lands be more cheaply and economically clayed on this plan than by raising subsoil clay by steam power, as in the preceding example? So long as the fens are farmed on what may not inaptly be termed the stagnant bottom-water system, the digging of trenches and the filling of them up again may do little harm. But if it be conceded, for the sake of argument, as we presume it must, that the old-school philosophy of expediency, involving stagnant water in the subsoil, is fast getting out of date, and, consequently, that at no great distance of time all fen soils will be thoroughly underdrained and otherwise farmed on sounder principles, then some very grave objections arise to the bringing up of subsoil clay, according to the present practice; for the trenches must, at the same time, be efficiently underdrained, so as to prevent stagnant bottom-water—an alternative which introduces not a few practical difficulties for consideration, owing to the unequal depth of the black earth incumbent on the clay, and the uniform depth of clay that requires to be raised to the surface. Now, if the clay can be brought more cheaply from the adjoining uplands, all such objections would, of course, be obviated; while fen lands, after claying, would be left in a more favourable position to undergo thorough bottom-drainage, aeration, and artificial watering (in times of drought) by steam power, or gravitation, where the hydrants are below the level of the river or fountains from which the water is drawn. And the application of water, as above, suggests the application of the clay on the principle of warping; but to this we must return in a separate article.

It will thus be seen that the question of cheapness and economy must not be hastily viewed in a penny-wise and pound-foolish light, either by landowner or tenant; in other words, the original expense of claying an acre of fen land must not be considered apart from the expense of under-drainage, harvest returns, and profits arising from the improved and more productive condition of the land generally. The expense under the present practice of raising subsoil clay by manual labour will exceed, in the outset, that of bringing it by railway from a considerable distance. If, however, machinery can be invented for raising it, the first outlay may be less; but if the deep bottom-trenches, from being uneven at the bottom, increase the expense of drainage, the difference may, in the end, be in favour of the railway system of claying. Then follow a series of practical questions as to which is the best quality of clay for applying to the fen soil under consideration, and which the system that will ensure the best work and produce the greatest returns in harvests, &c.

Claying fen land is a work which evidently belongs to the landowners' department of agriculture, more especially when the clay has to be brought from the adjoining uplands by railway; and, from the above premises, it is equally manifest that those who have a command of clay within themselves, so to speak, need not postpone the important work of improvement until the invention of machinery for subsoil claying is made. The soundness of this conclusion is susceptible of a ready-made practical demonstration; for the profits arising from the present rude practice, and the universal demand for the application of clay, place the practical question at issue beyond a doubt. In point of fact, we never pass through any of our extensive fen districts without sitting in judgment, as it were, upon this question, and pronouncing a verdict of guilty

against both landowners and tenants; for the work is a national one, imperatively demanding performance; and neither of them can plead a valid excuse for the bleak, inhospitable appearance which the contrary condition of things presents to the eye of the intelligent observer, let him be engineer or agriculturist. Moreover, the old proverbial query, "Will it pay?" is, in this peculiar case, excluded; for, if the present practice pays, the proposed one will pay better.

This brings us to the landlords' and tenants' pockets, or the expense to the landowner of claying an acre, and the interest which the tenant would have to pay for the capital thus invested.

Like most other great undertakings, small jobs would be more expensive than large ones, and work well done cheaper than that which has been alimpy or imperfectly performed. If, for example, a landowner has a large area of fen, it would cost less to do the whole at one contract than to extend the work over several seasons, doing it bit by bit, or so many fells or acres yearly. Again, the application of a depth of six inches of clay would not cost six times the outlay of one inch: in other words, more practically speaking, when one the railway is laid down, give the land such a coating of clay as will guarantee ample profits to the tenant, after paying redeeming interest to the landlord on his investment—such a coating as will pay both landlord and tenant well for their skill and capital.

Actual outlays and returns in harvest can hardly be approximated sufficiently near without an actual example, to be of any practical use. But certain principles of action may be definitely laid down with sufficient clearness to enable parties to form an approximate estimate for themselves. Thus, the whole work should be done on the taskwork plan; so much for the application of a cubic yard of clay to the land. The excavated clay, for example, can always be measured with accuracy, so that it is easy to calculate how much land a cubic yard should be spread over, whatever might be the depth determined upon to be given. Thus, at one inch of clay, a cubic yard would cover 36 square yards, being at the rate of rather more than 134 cubic yards to the acre; at a claying of 2 inches deep, 18 square yards per cubic yard, and about 269 cubic yards to the acre; at 3 inches deep, 12 square yards, and 406 cubic yards to the acre; at 4 inches deep, 9 square yards, and 538 cubic yards to the acre; at 5 inches deep, rather over 7 square yards, and about 672 cubic yards to the acre; and at 6 inches depth, 6 square yards, and 806 cubic yards to the acre.

Some sandy clays are easily handled, both in the filling and spreading, and such are probably the best adapted for claying soils. In carting on such open peaty lands with horses, we have had the work done at as low a rate as a penny per load for filling, each load containing rather more than a cubic yard, a like sum being paid for the spreading, counting nothing for horse work, but including the carman's wages in the filling; all the hands making 2s. per day. The thicker the top-dressing the less will be the labour and expense of spreading, and for a similar reason, when the carts are backed to a deep bank of clay, so that a great portion is above the level of the body of the cart, it will reduce the amount of labour and expense in the filling. For tenacious clays that adhered to the spade we have paid double the above price, or 2d. per load, and for stony clays 3d.

We have no experience in claying land by railways as proposed; but from the waggons being rather lower than horse carts, and from the regularity with which the loads would be emptied upon the land, the expenses should not exceed the above by horse work.

With regard to the expense of horse work in the conveyance per railway, as there would generally be a slight inclination downwards from the clay bank, it would cost very little more than the bringing back of the empty waggons or trucks. It follows that in details of this kind each case must be its own rule, so to speak; and the same may be said of the expense of the railway plant, trucks, &c.

As to the loss of land from the removal of clay, that would only be temporary or during the execution of the work, as the staple soil or top-spit could easily be removed and thrown back behind, should the sterility of the subsoil require it; but in many cases the loosening of the subsoil and its exposure to the weather would render it fit for cropping in a single season.

For extensive works two lines of rails would be required,

one the down-line for the loaded waggons, and the other the up-line for the empty ones; and the up-line this time would be the down-line the next time. From the down-line the waggons would be emptied on each side, right and left alternately, so that between the two lines there would be two rows of heaps or loads. In claying a large district of fen, the down and up lines of rail would pass through fences, and over cuts, open ditches, drains, and roads, and everything, in short, that did not interfere with the levels and traction of the waggons. At short distances junction lines would be required for shifting the waggons, when emptied, on to the up-line. The lines at the farther extremity would terminate abruptly; but the entrance to the grounds to be clayed would be by short curve lines, so as to avoid the expense and hindrance of right angles and turntables. These, the engineer or overseer in charge of the works would have no difficulty in laying down, to meet the peculiar demands of the case, whatever they may be, so as neither to increase undue expenses, nor retard the work of claying.

As soon as the two lines, the down and up, are laid, the work of claying would commence at the farthest extremity of the former or down-line. If we suppose that there are twenty waggons in a train, then the first down train would be emptied to the right, or left, as the case may be, and then drawn on to the up-line, when the second train of twenty waggons on its arrival would be emptied to the opposite side of the down-line, and returned by the up-line. This done, a gang of workmen would commence shifting the down line over to the other side of the first up-line for the second up-line, and as fast as the ground was clayed on either side of the first down-line. The work of shifting could be done at so much per yard or per hundred yards. As the third and fourth trains come down, they would be emptied right and left, as the first and second were; and so on for all the other trains until the first down-line was finished, when the first up-line would then become the second down-line, and so on. Thus the work would proceed with a great deal more regularity and expedition than in the formation of railway embankments, when the waggons have to be emptied one by one over the end of the line; for in claying land the whole of the waggons in the train could be emptied at once, or, practically speaking, during the time the team of horses was being unyoked from the one end of the train and yoked to the other, supposing that tractive force is required both ways down and up, the draught of the loaded train upon the down-line being about the same as that of the empty one returning on the up line, both gradients being about equal.

Contracts for claying fen lands would be free from the vast majority of those risks that attend the formation of railways

and other public works of a similar character; so that they could be undertaken at a minimum charge; and this applies equally to both the employer and employed. Fortune-making jobs on the one hand and ruinous speculation on the other would be the exception, and honestly-won wages and interest on capital to cover actual wear and tear on railway plants and rolling stock the rule. The work is doubtless a large one, involving an immense outlay of capital on the part of landowners; and brief as our remarks have been, they and all parties interested will readily perceive the soundness of the conclusion already arrived at, that when once the railway-lines are laid, and the work of claying begun, a thorough dressing of sufficient depth to consolidate the light puffy fen soil during the season of vegetation, and otherwise to increase its fertility in the highest degree, would be the cheapest plan; and *vice versa*, that half-done work although the cheapest in the outset would be the dearest in the end. But large as the investment of capital is—and we do not wish to conceal a single farthing of its magnitude from our readers—it is nevertheless, according to the old proverb, tantamount to buying land; and we do not hesitate to affirm that if landowners and tenants would lay their heads and shoulders to the work (like a good-going team), the latter could well afford to allow the former redeeming interest on their capital within the currency of not a very long lease, and have a larger balance remaining at their bankers at the year's end than at the present. The public gain would also be immense, for an efficient dressing of sandy clay would not only convert the staple of our fen districts into a rich loam, but it would also immediately lead to their thorough under-drainage, thus changing the somewhat bleak and unfavourable appearance which they everywhere exhibit to the eye of the traveller at present, giving to them a healthy air and inviting landscape. And from a public or national point of view this is not all that must be said, for besides our fen districts there are immense areas of peat bog and drifting sand that could be profitably clayed, and converted into crop-bearing land, through the instrumentality of railways. To the reclaiming of the millions of acres of Irish bog we may return in a separate article. But the "live bogs" of the Sister Country do not form the only example of the kind to which claying and efficient under-drainage apply; for besides our fens, there are in England thousands of acres that loudly call, at the present time, for the reduction of our proposition to practice. Were a million of the capital now prodigally squandered in poor's-rates, in supporting able-bodied but idle hands annually, for example, spent in improvements of the kind in question, the difference to the country is something worth talking about by many more than the out-and-out advocates of economy and retrenchment.

## CULTURE OF THE PARSNIP AS A FODDER PLANT.

[TRANSLATED FROM THE "JOURNAL D'AGRICULTURE PRATIQUE."]

Few persons in our country have as yet tried the experiment of planting many of their fields with parsnips, for the purpose of feeding cattle. Those who have tried it, invariably failed on account of their obstinacy in cultivating the parsnip by the same means used for the carrot and beetroot.

But supposing, on the contrary, rejecting the culture of roots, we treat it as a fodder plant, we shall obtain the most satisfactory results, and it will become a valuable resource in giving green fodder at a time of the year when such food is excessively rare.

One great advantage in the parsnip is, it never suffers from the attacks of frost, and it may be left in the field a whole winter without sustaining the slightest injury. It can be cultivated in any situation where beetroot and carrots have given satisfactory products; but the result will be much more sure and complete if care be taken to choose a fresh earth, substantial and deep.

It may be sown from the commencement of April to the 15th of May, in land prepared as for the culture of carrots; the seed should be sown in ridges nearly 18 inches apart (that distance is sufficient to obtain good results in green food). Two dressings should be given to the crop during the dry season, for the purpose of destroying the weeds, and if the plants are carefully thinned till they are about 3 or 4 inches apart,

by October the foliage will have attained the height of 12 or 16 inches. It may then be cut with a scythe to within 2 or 2½ inches of the ground, supplying the cattle with a dainty of which they are very fond.

Thus the fields will remain without culture until the end of February or the beginning of March, according to the season. By that time the heads will have again sprouted to the height of 10 or 12 inches, and may be cut as before, from the 15th of April following to the 15th of May. The vegetation is so active, that the parsnip rapidly reaches the height of 40 to 60 inches.

It therefore yields an abundant crop; in fact it is no exaggeration to say that one acre cultivated with parsnips gives at the first cut as much green fodder as 4 acres of lucerne.

At the last crop, the root should be drawn with the plant; and before giving parsnips in pasture to cattle, the roots should be cut up, and mixed with the leaves in bits.

Those of my milch cows which have been fed in this manner gave me from one to two pints of milk more than their ordinary produce. I ought to say, that unless green fodder is very much needed in October, it is always better to abstain from cutting it at that season; a much better crop will be obtained in February or March, which will more than compensate for the loss of the first cut.

BRIOT-DEROUEUX.



## THE WARWICKSHIRE AGRICULTURAL SOCIETY.

## MEETING AT STRATFORD-ON-AVON.

With a liberal prize list backed by good entries, with very excellent arrangements associated with a most attractive site for a show, the Stratford meeting promised to be the most successful the Warwickshire Society had ever yet known. There was, indeed, but one drawback, and that not the weather, which was as glorious as it has been for the last month or more. The first glance over the ground, however, went to convince one how terribly the panic was telling, as standing after standing in the more important classes of cattle was seen to be empty. The exhibitors of horses, sheep, and pigs had pretty generally sent in their stock; but the Messrs. Garne of Broadmoor and Churchill Heath, Mr. Lynn of Stroxtan, Mr. Duckham, Mr. Holbeck, and others from anything like a distance, prudently declined to run the risk of a railway journey, and thus limited the competition to the breeders more immediately in the neighbourhood. In the class, for instance, of Shorthorn cows, numbering some very good names, but one of the eight entries put in an appearance, and Mr. Worsey was accordingly recorded as the winner. In the pairs of three-year-old heifers, Mr. Hyde of Newbold became first under similar circumstances; and in the two-year-old class, Mr. Lythall took the first prize, and Sir G. R. Philips the second, with nothing further for the judges to select from. In the all-aged bulls, again, Mentor, a deep plain animal, had but another to beat, whilst amongst the two-year-olds the many withdrawals would seem to have cleared the way for Mr. Walker's Battersea First Fruits, the third prize of his class at Plymouth, where he showed a deal of promise which he is still developing; though the judges at Stratford declared that they saw his superior in Mr. Corbett's entry, a young bull, bred by Mr. Worsey of Clopton. The first yearling from Sevenhampton has no particular excellence so far, but the two prize bull-calves were both clever enough, and with this local offer the Shorthorn section, terribly shorn of its proper strength, came to a close, there being no question but that many of the best animals in the entry were kept at home. In the succeeding division of Herefords, Mr. Duckham scratched The Commodore, and thus left Mr. Read of Elkstone as the chief competitor of Mr. Baldwin, who so handy home brought something for nearly every class, and was almost as generally successful. Still, the Luddington herd is by no means so formidable with its young stock, and there were some heifers on view here that had far better been away, the more especially when put into comparison with the grand cows that their owner has been collecting with so much spirit. But the sensation of the day was over the bulls, with Battersea once more as the best bull of any pure breed; a class in which he beat a very good bull "in places" of Mr. Corbett's, and then came out to fight the Plymouth battle over again with Mr. Read's Peremptory, who had also won in his class, for the extra ten pounds as the best bull on the ground. And here the Judges and the public fairly divided, for the Elkstone bull has, if anything, improved since his visit to the far West, showing now full of muscle and good firm flesh; whereas Battersea is fading fast, with his touch gone, and a very noticeable lack of vigour about this once-famous bull. Still, the Judges were not slow in pronouncing him the better of the two, and so for the second year in succession Mr. Baldwin has held the chief

honours at home. Mr. Umbers, of Wappenbury, had the Devons all to himself, winning in the cow class with twins of his own breeding; and that champion of the old school, Mr. Chapman, once more brought Sparkenhoe to the fore, in illustration of what a prize animal really should be; and certainly, "for a Longhorn," the Upton bull is by no means a bad one.

The sheep show was said to be above the average of all the Warwickshire Society has been hitherto able to do in this way, and with the exception of the Southdown there was scarcely a breed but which was fairly represented. Mr. Lythall's Leicesters are of a fine useful stamp, though not up to the excellence of Mr. Creswell's two-shear, here first out since his season in Ireland, where he was let to Mr. Thunder. The ewes were not so good; but Mr. Bennett's theaves are all of Sir Tatton's blood, on either side of their heads, and this of itself is something of a character. Amongst the other longwools or Cotswolds Mr. Read distinguished himself with a shearing that took the extra premium as the best of all the Cotswold rams, and in so doing beat some very well-known sheep of Mr. Gillett's, the best shearing of the Oxford and West of England meetings, and the best of the all-aged rams at Plymouth. With the ewes and ewe lambs Mr. Gillett had more his own way, and his two pens of ewes were particularly good. In the Oxford Downs, again, some previous readings were corrected, and Mr. Bryan's prize Plymouth shearing was now without a place against another sheep from the same flock, put second, and one of Mr. Wallis' that never previously reached above a commendation, as the best of the class; while in the older sheep, the positions taken by the two Shiford sheep at Plymouth were reversed, the second being now first and the first second. The show of Shropshires, considering the locality, might have been stronger, and, with the exception of Mr. Bradburn's best two-shear, there was nothing very extraordinary in the small entry, where the flocks of Mr. Holland and Mr. Randell, as a consequence, had more attention than they have been able to command of late. Some of their ewes were really good; and Mr. Sheldon's shearing, a smartish ram, was commended in that large but incongruous class at Plymouth. There were some other local premiums for fat wethers and cross-bred sheep that brought one on to the pigs, where there were nearly as many premiums as competitors, the sample being not, on the whole, a very high one. For choice, Mr. Allender's two Berkshire sows, which were first and second in their class, had all the call, Topsy now strengthening her own personal recommendations by just a dozen young pigs as her last litter. Mr. Wells' large boar, long and handsome, and Mann's very neat small boar, were both worthy of their places; while Mr. Walker, of Bakeswell, won with a Tamworth sow, a breed that, like the Longhorn, we do not often see on the show-ground. Mr. Higgins of Binton, Sir G. R. Philips, Mr. Spencer, Mr. Smith of Henley-in-Arden, and Mr. James of Bridgton, were also amongst the successful exhibitors of pigs; the last-named with a Berkshire boar bred by Mr. Hewer, and Mr. Smith with some of his own sort, that come out so well at the Christmas gatherings in Bingley Hall.

As it was, with so much of the best stock away, the

strength of the Stratford-on-Avon Show centred over the horses, of which, either for heavy or light work, there was a very creditable entry, with competition enough to give Messrs. Atkinson and Swale a long and rather tiring day of it. Their best cart stallion was a smart roan three-year-old the property of Mr. Wynn, of Grafton, and in a very large class of agricultural mares and foals, their pick, after commending a rare old grey of Mr. Butler's, was declared to be a brown of Mr. Holton's, an active true-made mare, with a great fine foal at her foot, that unfortunately got kicked by one of the other mares when they were brought out. In the two-year-olds Mr. T. E. Bennett's compact good-limbed filly, which won the Champion Cup at Loughborough the other day, was here only highly commended, the one premium going to a higher, but certainly not in any other respect better one, bred and exhibited by Mr. Hurlston. The pairs of working-horses, with many useful animals amongst them, were still but seldom well matched, but rather paired, like rabbits in a poulterer's shop, with one good one and one bad one; but Mr. Canning fairly won with a couple of the blacks indigenous to Warwickshire. The best hunter-stallion was Wantage, by Collingwood, a fair race-horse in his time, and whose stock is now coming out with some recommendation in the way of good looks and limbs. There was nothing of "any account" entered against the old chesnut; but the lot of hunters, ridden during the past season with the Warwickshire, the North Warwickshire, the Atherstone, the Pytchley, the Bicester, the Heythrop, the Cotswold, or the Worcester, was better made up, including as it did three or four horses of some character. Amongst these Mr. Cook, of Taddington, sent a good useful grey, a fine fencer, and the prize horse at Tewkesbury, whilst Mr. Milward had the winner of the Tally-Ho Steeple Chase at Warwick also in the entry, though the judges eventually agreed to differ over the merits of two of the others. One of these was a deep powerful bay, the property of Mr. Sargeant, of Long Itchington; the other a brown, by Ethelbert, bred and exhibited by Mr. Sheldon, of Brailes, and a really clever horse at most points. Full of quality and style, with fine shoulders, and a beautiful goer in all his paces, Athelstane is up to lots of weight, and as handy as need be at his fences. Still the authorities could not agree, and Mr. H. Corbet being sent for to decide between them, gave the award in favour of the brown, who won a prize at Banbury in the spring, and for whom it is said Mr. Sheldon refused an offer of something like 400 guineas during this meeting. The best hunter found a worthy companion in the best hack, a class in which Mr. J. E. Bennett, of Bosworth Grange, and the owner of Lady Florence, showed as sweet and almost as perfect an animal of her inches as a man would wish to see. Standing but fourteen two, "Octoroon," by Oulston, dam by Belzoni, has that great first "principle" of a hack—beautiful, easy action, with a deep, wiry, bloodlike frame, a good head, a light neck, and beautifully-placed shoulders. Up to a certain weight, the brown galloway would be worth almost anything; and Mr. Bennett has also, as we hear, refused a long price for his entry. The ponies were but a middling lot, and the cobs had not been out when we left the horse field, but Mr. Clark of Claverdon found the winner, while Mr. Sargeant righted in another hunter class, with a great useful four-year-old by Pontiff, a bay, with plenty of length and reach about him; and Mr. Knott claimed the best farmer's horse ridden with hounds in Warwickshire, with a bay of the right stamp, but in want of a cross more blood about him. Another premium for hunters ridden by farmers went to a brown, by Erix, in rather rough company; while Mr. Robins, of Bagington, showed the best two-year-old, a fine-grown colt by Oscar; and Mr. Hurlston,

of Ditchford, the prize brood mare, helped out as she was with a capital foal by Neville.

Mr. Wortley and Mr. Toone had another hard morning's work in distributing their £50 amongst the implement makers, and of which delicate investigation we subjoin the results; as with nothing more to pay there were companion shows of roots, fruits, flowers, and shepherds' dogs, with Mr. Godfrey and his Grenadiers in full tune, and a dinner on the ground, at which the ladies were especially invited to be present. If to all this we add the many attractions of the town itself in the way of Shakespeare's house, the church, and the calm beauties of the Avon, then the Stratford Show must be recorded as a success, despite the heavy cloud still impending, and the fear and trembling with which good animals are now brought together.

The best iron plough.—W. Glover and Sons, Warwick.

The best wooden plough.—W. Glover and Sons, Warwick (protest entered).

The best iron scuffle.—G. Ball, Kilworth, Rugby.

The best wooden sheep-trough.—Ball and Sons, Rothwell.

The best iron sheep-trough.—W. Glover and Sons, Warwick.

The best set of gears.—T. Humphries, Stratford.

The following prizes were also given:—

Messrs. Ashwin and Co., Stratford-on-Avon.—Ransomes and Sims' jointed harrows, £5; Snowden's patent paring plough, £1; pivot feeding trough, £1; Bentall's pulper, £1; Nicholson's haymaker, £1 10s.; Howard's haymaker, £1 10s.; Hornsby's pulper, £1.

Ashby and Jeffrey, Stamford.—Haymakers, £1; rotary harrow, £2; chaff-cutter, £1 10s.; hay-rake, £1.

Ball, Kilworth.—Waggon, £2.

Ball and Sons, Rothwell.—Cart, £1 10s.

Richmond and Chandler.—Chaff-cutter, £2.

J. Bradford.—Washing machine, £1.

Larkworthy and Co., Worcester.—Winnowing machine, £1.

T. Baker, Compton.—Thorney's water-cart, £1.

Barrows and Carmichael, Banbury.—Watts and Rickards' American grist mill, £5.

Dodge, Upper Thames-street, London.—Endless machine banding, £3.

W. Glover and Sons, Warwick.—Hunt and Pickering's cheese press, £1; Hunt and Pickering's paring plough, £1; Hunt and Pickering's chain harrows, £1.

R. Humphries, Pershore.—Combined thrashing machine, £5.

Parkes and Co., Birmingham.—Selection of tools, £2.

Woods and Cockedge, Stowmarket.—Horse gear, £3; crushing mill, £2; tarpaulin cutter, £1.

The following gentlemen acted as judges:—Cattle: E. Franklin, Ascott, Wallingford; J. Jones, Springfield, Hereford. Sheep, Pigs, and Dogs: J. B. Twitshell, Wilby, Northampton; H. Osborn, Wreford Park, Tamworth. Horses: R. Swale, Saredon, Wolverhampton; W. T. Atkinson, Barrowby, Hall, Woodlesford, Leeds. Implements: E. Wortley, Ridlington, Uppingham; J. Toone, High Cross, Lutterworth. Ploughing and hedging: R. Swinnerton, Nuneaton.

**HAY ASTHMA.**—As there are very few bronchial diseases as little understood as that popularly called "hay fever," and as one or two letters on the subject have recently appeared in your columns, without giving any real means of cure, I am induced to avail myself of your pages to place the real state of the case before the sufferers from this very prevalent and distressing complaint. It is simply inflammation of the bronchial passages, caused by the contact of the floating pollen of hay, and a few wild plants that also yield the same irritating substance. It is with difficulty distinguished from ordinary coryza; and it cannot be cured by any known remedies; and a removal from the locality in which it is experienced, affords the only chance of relief. Temporary mitigation of the severer symptoms may be obtained by using powdered camphor in the way that snuff is usually taken.—GEORGE BARETT.

## KINGSCOTE AGRICULTURAL ASSOCIATION.

The annual ploughing match of this vigorous and flourishing society took place on Sept. 14th in a field at Latterwood, in the occupation of Messrs. Ford. The soil was a two years' ley in capital condition, and the day was splendidly fine. There were 50 entries—the largest number the society has ever yet had, and 48 teams started at nine o'clock. Half an acre was assigned to each team, four hours being allowed for the work. The quality of the ploughing, particularly that of the champion class, was of the best possible character, and gave the judges a very difficult task. There was a large gathering of farmers on the ground, and they all declared they had never seen superior ploughing. The following is a list of the prizes awarded:—

## PLOUGHING MATCH.

A champion prize, open to any competitor who shall plough half an acre of ground in the best and most workmanlike manner with a pair of horses and no driver, £3, William Baylis, servant to Colonel Kingscote. To the best ploughman with a pair of horses and no driver, £2 10s., Henry Ball, servant to Mr. Henry Holborow, Willesley (Haynes's plough). To the second-best, £3 5s., C. Long, servant to Mr. B. Long, Nestley (Haynes's plough). To the third-best, £2, G. Collett, servant to Mr. R. S. Holford, M.P., Welfonbirt (Haynes's plough). To the fourth-best, £1 15s., W. Evans, servant to Mr. W. Drew, Bowldown (Howard's plough). To the fifth-best, £1 10s., Henry Beale, servant to Mr. Drew, Calcott (Ransome and Sims's plough). To the sixth-best, £1 5s., David Soutar, servant to Colonel Kingscote (Hornaby's plough). To the seventh-best, £1, Daniel Cleveley, servant to Mr. Tanner, Leighton (Ford's plough). To the eighth-best, 15s., W. Townsend, servant to Mr. W. Thomas, Star-and-Garter farm (Haynes's plough). To the best ploughman under 18 years of age, with a pair of horses and no driver, £2 10s., J. Kendall, servant to Mr. Worlock (Haynes's plough). To the second-best, £2, H. Ashman, servant to Mr. Blackwell (Hornaby's plough). To the third best, £1 10s., H. Powis, servant to Mr. B. Drew (Ford's plough). To the fourth-best, 10s., J. Rudge, servant to Mr. W. Long (Haynes's plough). To the fifth-best, 10s., James Heaven, servant to Colonel Kingscote. To the sixth-best, 10s., George Cox, servant to Mr. Holborow, Bagpath. To the best ploughman with a team of oxen and a driver, £2, B. Evans, servant to Mr. O. Blackwell (Hornaby's plough). To the second-best, £1 10s., James Butler, servant to Mr. W. Drew, Bowldown (Hornaby's plough).

## TO SHEPHERDS, FOR THE ENCOURAGEMENT OF CARE AND ATTENTION TO THEIR FLOCKS.

To the shepherd who, from a flock of 50 or any greater number of ewes, shall rear the largest number of lambs, and save the greatest number of ewes in proportion to the number put to the ram; the lambs and ewes being alive on the first day of June, or *bond fide* sold at previous to that time, £1, Charles Goodrich, shepherd of Mr. T. Price, of Kingscote; number of ewes saved 50, number of lambs reared 63. Ditto, for the second greatest number, 10s., Thomas Hooper, shepherd to Rev. A. G. Cornwall, Ashcroft; 52 ewes, 61 lambs. Ditto, from a flock of 100 and upwards, £2, Henry Savory, shepherd to Mr. T. A. Stoughton; 102 ewes, 130 lambs. Ditto, for the second greatest number, £1, Richard Nicholls, shepherd to Mr. C. Norris; 104 ewes, 115 lambs. Ditto, from a flock of 200 and upwards, £3, Charles Wakefield, shepherd to Mr. H. Wigmore; 200 ewes, 244 lambs. Ditto, for the second greatest number, £2 10s., Jesse Hunt, shepherd to Mr. D. Holborow; 234 ewes, 254 lambs. Ditto, for the third ditto, £2, John Stuart, shepherd to Mr. John Fowles; 265 ewes, 287 lambs. Ditto, for the fourth ditto, £1, Richard Day, shepherd to Mr. E. Drew; 227 ewes, 251 lambs. Ditto, from a flock of 300 and upwards, £2, Thomas Fawkes, shepherd to Mr. C. Ford; 315 ewes, 351 lambs. Ditto, for the second greatest number, John Scrievens, shepherd to Mr. G. Robinson; 309 ewes, 250 lambs.

## FARM SERVANTS.

To the agricultural labourer who shall have continued in the employ of his master, or who shall have worked on the same farm (with good character and recommendation) the greatest number of successive years, £2, W. Underwood, servant to Mr. E. Rich, Willesley, 39½ years. Ditto, for the next longest servitude, £2, George Cox, servant to Mr. D. Holborow, Bagpath, 37 years. Ditto, not exceeding 25 years of age, £1, William Neal, servant to Mr. Wigmore, of Avening, 10 years.

## FOR IMPROVING THE MENTAL AND MORAL CONDITION OF AGRICULTURAL SERVANTS.

To the agricultural labourer or female servant, for the best account of "The Life and Times of Daniel the Prophet," with practical reflections thereon, £3, Timothy Leonard, servant to Colonel Kingscote. A young man named Fawkes had also written an extremely good essay; but he was disqualified from taking a prize, as he had already done so. The committee awarded him £1 to give to some charitable institution.

The Dinner was held at Hunter's Hall, at half-past three, to which about sixty sat down. The chair was filled by Colonel Kingscote, M.P., the president of the society.

The CHAIRMAN then proposed the toast of the evening, "Success to the Kingscote Agricultural Association." He proceeded to say that societies like these were of immense value to the farmers; they diffused intelligence and a high tone of feeling among all in the neighbourhood, and united all classes upon many occasions. There was great good in the monthly discussions which the members carried on during the winter. The most moonlight nights were selected for this purpose, and profit was derived by everyone who took part in them. There was a strong feeling throughout the country that something more ought to be done for the education of the farmer. He was himself on the council of the Royal Agricultural Society; and he was also put upon the education committee of that council, which was appointed this year. There had been much discussion on the subject; and the majority of the committee were for only taking up the existing machinery of middle-class examinations, and adapting it in the best way to agriculturists. Those subjects were published; and the committee had decided to aid the examination of the agricultural class in botany, chemistry, geology, and kindred subjects. Now he himself took a different view. He thought the Royal Agricultural Society ought to begin with a practical examination in agriculture. The majority were against that; but Mr. Holland, Mr. Randall, and himself put forth a protest. The argument of the majority was, that a practical examination could not be carried out, for that you could not get examiners of the same mind; and that pupils would come from different parts of the country, where entirely different systems of farming were pursued. Well, all he could say was, it ought to be tried. This little society had taken a step very much in the right direction. It had established a class for instruction in chemistry; and he was sure any man must be a dolt who could not understand the extremely clear and valuable instruction given by Mr. Church. It was a useful subject for farmers to take up; and he hoped other classes equally useful would be formed. He did his best in committee to get the Royal Agricultural Society to give prizes in aid of agricultural knowledge like this. The farmer was under difficulties as regarded the education of his sons. There were few places suited to farmers' sons as regarded their means and requirements; they needed a good general and practical education. They were colleges in Devon and Suffolk for carrying out this object; and there ought to be such in every county. It was necessary that there should be a practical and a physical education. He had no doubt that the masters of those ploughmen who took prizes to-day could handle the plough skilfully, and show their men how to do it. It might be said that this county had the Royal

Agricultural College at Cirencester; but that, he thought, had overshot the mark altogether. It was too expensive; and, as to their management, they had been obliged to give up their farm to a tenant-farmer. If they could not make it answer, all he could say was, they ought to. He concluded by proposing the toast, and, regretting the absence of Mr. Harrison, the president, coupled with it the name of Mr. Burnett, the secretary.

Mr. BURNETT responded at considerable length. He said he had occupied the position as vice-chairman six or seven years ago, and was delighted at the growth of the society. He contrasted its present position with its beginning. At the first meeting the ploughing was wretchedly bad; the ploughs could not keep on their own land, and were running on to their neighbours'; but to-day the ploughing was excellent, and he did not believe that superior could be seen in England or elsewhere. During the past season they had had some very instructive lectures, and also many most useful and interesting discussions, in which all could take part and benefit by the interchange of ideas. Mr. John Morton had offered to give them the introductory lecture of the ensuing course gratis, and his subject was to be Education. He felt that it was needful that something should be done for a purely agricultural education. That education ought to be practical, and he would guarantee to find within the limits of this society ten or twenty young men who were fit to stand before any examiner in practical agriculture. But when the came to the Oxford examination that was a different thing, and the difficulty was to combine the two branches of education at a rate within the farmer's means. Having referred with approval to the chemistry class, he said he had used his best exertions as secretary, and this match to-day and the attendance at dinner would stimulate him very much.

Mr. T. A. STOURTON returned thanks.

Colonel BULLER rose to propose "The Tenant Farmers." He alluded with regret to the fact that there was no entry in the class for farmers' sons, and urged that they ought to be learning their fathers' trade, and that they ought to be in a position to teach their men how to handle a plough properly. In the county of Devon there was a capital school of the kind referred to by the Chairman, under the superintendence of Mr. Brereton, where a good education was obtainable at a

reasonable price, and he did not see why such a school should not exist in every county. Although on these occasions "politics are strictly and entirely forbidden," yet as both the members were present he would call their attention to the question of the repeal of the malt tax. The county had chosen to adopt free trade, rightly or wrongly; and *prima facie*, therefore, there ought not to be any tax at all upon malt. But on the other hand, its abolition would cause a revenue loss of five or six millions, and he would ask those present if they were prepared to substitute an increased income-tax for any part of this. Reverting to the toast, he remarked that the landlords needed good and confidential tenants, in whom they could place confidence, and who placed confidence in them. He did not believe there was in England a more straightforward class of men than the tenant-farmers, and therefore he had the greatest pleasure in proposing their healths.

Mr. BOLZ: I have a toast to propose, and it would be a serious fault to omit it—the "Health of the Agricultural Labourers." I desire to give it not as a mere ceremony, but, as I hope you will receive it, from the heart. You will readily believe that with my political sentiments, which are the sentiments of all of us here on this subject, none of us propose to elevate the labourer into the governor of the country. That is not our intention; but it is our intention and duty to elevate his mental, moral, and physical condition to the utmost of our power: that is our duty. It is the duty of the landlord; it is especially the duty of the tenant-farmer; it is the duty of the clergy; it is the duty of every one of us. They are the bone and sinew of the country, and without them we can do nothing; and while we feel and declare that as long as there must be hewers of wood and drawers of water their condition cannot be that of affluence or ease, nor can they be placed in a condition, at present at least, of governing the country, yet we owe so much to them—our comfort, our happiness, the well-being of the country depend so entirely upon them—that when we neglect their mental, moral, and physical condition, and do not do our best to promote it, we neglect our most sacred duties. I call upon you to drink the better and happier condition of the agricultural labourer, pledging ourselves to do all that lies in the power of each of us to promote his prosperity.

## HEREFORD AGRICULTURAL SOCIETY.

### ABANDONMENT OF THE SHOW FOR THE PRESENT YEAR.

On Wednesday, Sept. 13, a special meeting of the members of the Herefordshire Agricultural Society was held at the Green Dragon Hotel, to consider the propriety of abandoning the show of stock for the present year, consequent on the cattle plague. The Rev. Archer Clive, the president of the Committee, was in the chair.

The SECRETARY said that in consequence of a letter which he received last Friday morning, signed by some members of the Society, he consulted Mr. Jancey, the vice-chairman of the Committee, and other members, and it was decided that a meeting should be called to take into consideration the propriety of abandoning the show for the present year, in consequence of the cattle plague which had broken out. There had not been time to advertise the meeting, but other means had been taken to give it publicity, and bills had been sent to Leominster, Ledbury, Ross, and other places. He had received several letters from persons who usually exhibited, but some were applications for certificates.

On referring to the letters, it appeared that two only of the writers expressed opinions as to the propriety of holding the show, viz., Mr. Haywood, of Moccas, who thought it should not be held, and Mr. Nott, of Glasbury, who doubted the desirability of holding it. The others were merely applications for certificates in the usual way, in the event of the show being held.

The SECRETARY added that some members had paid their subscriptions, and others had not paid. About £84 had been received for subscriptions for the present year, a balance of £37 from general subscriptions of last year, and £45 for prizes for the current year, making a total of £166 in hand. If the

show were not held, it would become a question whether or not the money subscribed on account of this year should be returned, and then there would not be enough to pay the expenses.

The CHAIRMAN said that if the meeting decided that the money should be returned, the expenses must be first paid, and the balance only given back.

Mr. TAYLOR (Showle) thought there should be no money returned, and that the subscribers would not expect it.

The CHAIRMAN said the first thing to consider was the desirability, under the present circumstances of the country, of holding a show of cattle this year. As there were many persons in the room better qualified than himself to give an opinion on such a question, it would perhaps be superfluous for him to enter into it; but as there was a possibility of some of their herds being attacked by the disease before October, he thought it would be expedient to defer the show altogether for the present year.

Mr. DAVIS (Webton) said he quite concurred with the chairman. Having so lately had a large show, and the disease being prevalent in neighbouring counties, he thought it would be prudent to keep away cattle from distant parts by abandoning the show for this year.

Mr. J. E. JONES said that on the previous day he had attended the Warwickshire show, at which there was a large number of entries, but very few animals exhibited, the breeders being afraid of the disease. The show was, indeed, considered quite a failure. He thought it would be wise to abandon the show for the present year, more especially as they had recently had the meeting of the Bath and West of England Society,

The CHAIRMAN said that several gentlemen whom he had spoken to on the subject agreed in the opinion that it would be desirable to abandon the show for this year.

Mr. TAYLOR said that if the show were held, a great many breeders who usually exhibited would not send their stock; the show would consequently be a failure, and therefore he thought it would be very wrong to hold it.

The CHAIRMAN said the question for decision was one which

all present must have more or less considered in their own minds before they came to the meeting, and therefore he should at once put it to the vote.

It was then unanimously resolved that the usual October show shall for the present year be abandoned.

A resolution was then passed to the effect that the annual subscriptions should be paid as usual, to meet expenses already incurred; the balance to be carried to next year's account.

## THE DIGESTIVE ORGANS OF THE HORSE.

At the usual monthly meeting of the members of the Wincorpe Farmers' Club, Mr. Blake, veterinary surgeon, of Wimborne, delivered a lecture on "The Digestive Organs of the Horse."

Mr. BLAKE said: Gentlemen,—The subject I have selected for my thesis this evening, viz., "Diseases of the digestive organs," will comprehend those affections which are most frequently met with in our agricultural stables. It will be necessary to take a cursory view of the various organs forming the digestive apparatus, and to make a few remarks on the process of digestion. First we have the lips for gathering together the food; next the incisor teeth; then the molars or grinders, between which the food undergoes the process of mastication, and becomes insalivated by the pouring out of saliva from the various salivary glands, and which secretion is conveyed into the mouth by a duct peculiar to each gland. The pellet of food being masticated and insalivated, is passed back to the pharynx and through the oesophagus into the stomach, where it is acted on by the gastric secretions and becomes a chymous mass; it then passes through the pyloric opening of the stomach into the first small intestine, which is called the duodenum, and in which it meets with the secretion from the liver and pancreas, then into the jejunum and illium; these comprise the small intestines. The food then passes into the cæcum, thence into the colon, next into the rectum, whence the effete or excrementitious matter is ejected, the nutritious parts of the food having been absorbed by the lacteals through its whole course from the stomach, and passed into the circulation for the formation of new blood. In cattle and sheep the stomachs are four in number, viz., the rumen or paunch, the reticulum, the omasum, and the abomasum; the last is the true digestive stomach, the others being preparatory, and reducing the food by the process of rumination and remastication, and afterwards, by tuberculation between the muscular leaves of the omasum, into a proper state for entering the fourth or true stomach. Throughout the whole course the digestive canal is lined with mucous membrane, has strong muscular walls, and are externally covered by the serous membrane, which is called peritoneum. I shall, I hope, have said enough to make myself understood on this matter, and will at once take into consideration the diseases of which I am about to speak. The first, beginning at the mouth, will be disease caused by

**Dentition or Cutting of Teeth.**—From a few months after birth until five years old the process of teething goes on; but, although limited to that time, the growth of the teeth continues through life, so that, in fact, at no period of life is an animal exempt from the influence of dentition, which is the reason that we find occasional cases of lampas in old as well as in young horses. The effects of dentition on the constitution are fever, catarrh disorder, glandular enlargements, cough, ophthalmia, irritation, and derangement of the bowels and urinary organs, loss of appetite, and emaciation. Long continued irritation would bring on a susceptibility of disease, rendering the body more prone to be acted on by morbid agents, and increasing the violence of disease when once set in; for this reason, when young horses are unwell, it is necessary to examine the teeth, particularly the tusks, which, if prominent and accompanied by much redness of the gums, should be let through by making a crucial incision down on the tooth and the removal of any temporary teeth which appear to obstruct the growth of the permanent or coming set. In these cases it will be necessary to diet the animal on easily masticated food—bran, crushed corn, linseed, carrots—and pay

attention to his bodily health by means of laxative and fever medicines.

**Lampas.**—According to D'Arboval, a French veterinarian, this word is of French origin, and is a stable term which has found its way into veterinary medicine from its having been figuratively used to signify the palate or inside of the mouth. What we understand by it is, an enlargement or bulging of the bars of the month, being in some cases lower than the surfaces of the teeth. This enlargement depends on congestion of the blood vessels and effusion of serous and albuminous matter into the cellular membrane, attaching the bars to the palatine bones. Although in young horses this is generally attributed to dentition, yet in old horses some people ascribe it to other causes, and imagine they have much to do with the animal's health and feeding. No doubt it sometimes produces soreness at the same time. In these cases the loss of appetite will probably be traced to some other cause. Many a poor horse is made to undergo the torture of having his bars burnt out with a hot iron to satisfy a prejudice, when it would have been better and more humanely treated with a lancet.

**Diseased Teeth.**—Should any exist they should be removed, and if they become sharp and wound the cheeks their edges should be taken off with a tooth-rasp. Parrot mouth is not a disease but a malformation, the top jaw overhanging the lower, and thus preventing the animal from collecting and masticating his food, particularly when at grass; such animals should be kept in the stable, or diseases of teeth are frequently met with. Pharyngitis is frequently met with in conjunction with influenza, and is sore throat, in which we find there is great difficulty of swallowing, a ropy discharge from the mouth, with occasionally fetid breath, fever, acceleration of pulse, loss of appetite, cough, and injection of the mucous membranes. Here, as in all cases of illness, I would advise the use of clean and cool stables, covering the body with cloths, bandages to legs, sloppy mashies, gruel, and soft food for diet, moistened plaisters to throat, a little nitre put in water, an ounce a day. Should the symptoms not subside blisters should be tried.

**Choking.**—Occasionally a portion of food becomes lodged in the pharynx or oesophagus. Grain, potatoes, carrots, swedes, and even with hay and vetches, I have seen horses choked. Greedy horses are most liable to be thus affected, from swallowing their corn whole, and instead of passing to the stomach, it accumulates in the oesophagus and blocks up the passage. The symptoms are—the horse leaves off feeding, and makes every effort to swallow; should he not succeed his throat and neck become spasmodically drawn up, and he makes a peculiar noise, expressive of his own anguish, and exciting the compassion of his attendant. Should he attempt to swallow water it returns through the nose, and saliva runs from the mouth. An examination by the throat often shows us the seat of the stoppage. If in the pharynx, remove with the hand; if out of reach, at once have recourse to the probang, not too large a one, nor with violence; if not removed in this way it must be cut down on and the impaction removed.

**Diseases of Stomach.**—Plain, simple, and little varied as the diet of the horse is, it would be imagined that his stomach would rarely experience any disorder, and in point of fact from the quality of his food it rarely does; but it is liable to great abuse from the quantity of aliment introduced, the animal being so subject to the will of his master that he often goes for a long period without food, and then is supplied with so large a quantity that his stomach becomes over-filled. The

stomach of the horse, as compared with other viscera, as also with the bulk of the body, is remarkably small; the reason for which appears to be that it might not contain a sufficient quantity of food to impede the process of respiration by its pressure on the diaphragm, and physically to incapacitate the animal from sustaining exertion on a full stomach, the horse being often called upon to exert himself after a full meal, and as the stomach is so small it stands to reason that it requires filling oftener than the stomach of other animals. A dog does well on one meal a-day, but the horse will not do well unless he is feeding for a considerable part of his time. At grass he is constantly grazing; in the stable he is fed three or four times a day on corn, and if not supplied with hay will set about eating his litter; for, however nutritious his food may be, experience teaches us that quality will not prove a substitute for quantity. By the laws of physiology we cannot suddenly change the habits of an animal or of any of its constituent organs without entailing disease, although alterations may be by degrees introduced and become so confirmed by time and usage as to constitute in effect the natural habits of an animal. The most fatal disease of this organ in the horse is generally known as staggers, and is the result of a distended state of the stomach from eating greedily a quantity of food after long fasting. It most frequently occurs amongst cart-horses and those of coarse breed. The best way to avoid it would be by the use of the nose-bag, or in the stable of using iron-bars across the manger, that the animal may have more difficulty in collecting his food. When the stomach is surcharged with food without any tympanitic distension, it does not appear to give any local pain, but gives rise to cerebral symptoms. The horse becomes drowsy, rests his head in the manger or against the wall, takes food into his mouth and goes to sleep with the same; he moves about his fore feet, the breathing becomes stertorous, the eye aromatic, pulse slow and tardy, respiration slow and oppressed, excretions diminished. The treatment must consist in endeavouring to get the food to pass from the stomach. We cannot vomit the horse, and the means generally adopted is the giving cathartic medicines—linseed oil and aloes in solution, together with stimulants, as carbonate ammonia in conjunction with enemata. The stomach-pump has been suggested, but I have not seen it used. It is generally advisable to extract blood to relieve the congested condition of the brain: but unless the stomach is relieved of its load, fermentation will take place, gaseous distension ensue, and rupture terminate the case.

**Indigestion.**—In man, whose digestive organs are somewhat differently constructed from those of the horse, the stomach is considered the grand agent of digestion; but in the horse, as a graminivorous animal, who is always feeding, his food occupying a large space compared with the size of his stomach, it would appear to be not so important an organ as in the human system. To say therefore that indigestion is owing to some fault of the stomach alone would be taking too confined a view, equally so to hold that organ to be faultless, as we shall frequently find some other organ implicated in this derangement. The intestines are more frequently the seat of indigestion than the stomach, from the short time the food remains in that viscus, and the much that is required in the intestines to complete the process of digestion. Symptoms: The horse does not thrive, and although his appetite is good, sometimes voracious, at one time he feeds well, badly at another; sometimes it is depraved, he eats dirt, mortar, or any extraneous matters that he can get at; the coat stares, is dry and scurfy, and does not shed well; he becomes hide-bound, and wastes away; his feces are unhealthy, have an offensive odour, and is either lighter or darker than usual, and when broken appears to consist of lumps of loosely compacted chopped hay and undigested corn, sometimes covered with slime. In the stable the animal is inclined to be covetive, but when at work is subject to diarrhoea; often the skin is covered with eruptions. The ordinary seat of indigestion would appear to be the villous membrane of the stomach or intestines; this membrane in both organs furnishing secretions necessary for the conversion of the food into alimentary and feculent matters. Various other causes may be in operation; the secretions from liver or pancreas may be deficient in quantity or defective in quality, the food may be unseasoned, depending on the condition of the teeth, or from ravenous feeding, or the animal may suffer from worms, but this I take rather as a result than a cause of the disease; how-

ever, should they exist measures must be taken to get rid of them. The subjects of indigestion are generally three, four, or five-year-old horses that have been reared in low, marshy, cold, and poor pastures; the bad quality of their food seems to lay a tendency for disorders of the bowels, which is no doubt accelerated by damp and exposure to weather. Commonly, with change of diet, care, and a little medicine, they outgrow this unhealthy condition; but many remain subject to it through life. Some horses experience indigestion while living in the stable; occasionally a horse turns out unthriving and looking bad without being off his feed or being unable to work, yet we cannot discover any positive disease. We inquire as well as we can as to the state of his digestive organs, and generally find them to be in fault. The ordinary mode of treatment is by aperients, a mild dose of calomel and aloes at intervals of a week or fortnight. If worms are present this will generally effect a cure. Tonics, alteratives when the liver is inactive, the hydrg. cum creta with vegetable tonics may be given daily; change of food, mucilaginous drinks, linseed, crushed corn and chaff, bran, carrots, swedes, &c., may be tried; but occurring in the stable nothing does better than a run at grass if the season admits.

**Spasm of the Intestines.**—The most common perhaps of all diseases amongst farm horses is spasm of the bowels, commonly designated fret, colic, or gripes. The causes of this affection are ordinarily drinking cold water whilst the animal is warm, change of water, especially from pond or river water to that which is impregnated with mineral salts, suppression of perspiration, sudden chills, vetches and other green foods, new wheaten straw, and pea haulm; barley dust especially I have found to produce this disease, and in fact any food of a rough nature and containing much woody fibre is likely to produce the disease, especially when the horses are newly fed on it. I think it would be well here to draw a distinction between the affection where it can be traced to be the result of the nature of the food of which the animal has lately partaken, from it as occurring after drinking cold water, &c., as in the former case we shall be sure to have an accumulation of undigested rough food in the large intestines to be got rid of and requiring purgative medicine, whilst in the other we have simple spasm more under the control of medicine, and yielding more quickly to its action. The seat of spasm is in general the small intestines, though it is occasionally met with in the large. In all cases of spasm of the bowels it will be necessary to make ourselves acquainted with the cause if possible. Has the animal had cold water and change of food? Has he been exposed to the inclemency of the weather, &c.? These questions not affording a clue, examine the animal's pulse. Is it much increased in number—are the mucous membranes injected—is there any hernia existing? This especially in entire horses is a necessary inquiry, as inguinal or scrotal hernia frequently exists, and becoming strangulated would give cause to the symptoms of spasm, viz., the horse suddenly crouches down his hind quarters, twists and flicks about his tail, throws himself down rather than lies down, looks back at flanks, rolls about, gets up again, but quickly to fall again, rolls on his back, dashes himself about, moans with pains, perhaps passes a small quantity of feces, and may be strains to urinate; cold sweats bedew the body, the ears and legs become cold; these symptoms unrelieved soon become aggravated, the horse becomes nearly frantic with pain, the pulse will be quick and thready, the countenance assumes a deathly aspect, the animal lies down more quickly, or stands for a longer period, and sometimes stands till he drops dead. Millers' horses are subject to calculus, arising from being fed on bran. The presence of some foreign agent is necessary to form the calculus—a nail, bit of lead, or some such matter taken with the food is left in one of the large intestines, generally the cæcum; here it becomes covered with a coating of mucus, and rolling round collects on it the earthy particles of the bran, and in time arrives at great weight and size, and causes death. The treatment of spasm consists in the use of such medicines as by their action on the nervous centres will relax muscular contractions, and are called antispasmodics; spirits and aromatics rank amongst these, the reason why gin and pepper sometimes relieve. *Ethers*, *Spts. Ann.*, *Ar. Tinct.* *Opis*, and *Hyocianus* are the best agents combined with aloes or linseed oil. Enemata are very necessary, and are easily administered by a funnel carved to admit of the cup part remaining upright, whilst a tube extends at a right angle, long enough to introduce into the anus; hot fomentations to the

abdomen, mustard and hot vinegar plaisters and bleeding. If the symptoms do not subside, recourse must be had to further bleeding, blisters, calomel, and opium; but this no doubt would by this time come under the notice of your veterinary surgeon. Volvulus and intussusception are often the result of spasm, and are not discovered till after death, nor would much good occur from doing so unless by opening the animal we could untwist or set free the impacted or strangulated part.

**Enteritis.**—The causes which would produce spasm would also cause enteritis; in fact, all cases of spasm that I have ever seen terminate fatally have always run into this form of disease, occasionally complicated with volvulus intussusception or stoppage of the bowels. Constipation may be viewed both as cause and effect, collected and hardened feces being in themselves irritant, obstructive, and subversive of the functions of the bowels, and may lay the foundation for an attack of inflammation; bad food, calculi, irritating matter of any sort, over-fatigue, and consequent irritation of the bowels, suppressed perspiration, cold from exposure, wetting skin when hot with cold water, worms, and spasm may be mentioned as causes. The symptoms of enteritis are, as far as regards the expression of pain, similar to those we find in spasmodic colic—as lying down, rolling about, looking back on flanks, and sweating; but in enteritis we shall find the visible mucous membranes much injected, pain on pressure to the abdomen, and the pulse quick, full, and wiry; the horse also lies down more carefully, the belly is drawn up, and the countenance looks anxious. Enteritis is not so sudden in its attack as spasm, and is generally ushered in by previous indisposition, constipation of the bowels, diarrhoea, or an unhealthy state of the feces, want of appetite, dulness, and fever. The respiration

is hurried, nostrils dilated; he looks frequently on his flanks and groans with pain; body bathed with sweat, sometimes hot, at others cold; ears and legs cold; tail erect and quivering; convulsive trembling of the muscles. The animal becomes delirious with pain, and dashes himself about, rendering it unsafe to approach him. Mortification at length sets in, when the symptoms abate; but, alas! this is only the forerunner of death, which speedily ensues. The treatment must be bold and energetic; bleeding to faintness, purgative medicine, opium, and calomel, counter-irritation to abdomen, which should be speedily and powerfully applied. Mustard plaisters, hot fomentations, enemas, tobacco-smoke, enemata, oleaginuous and opiate enemas must all be tried; bandages to legs, stimulating embrocation to the same, clothing body, administering warm gruel, and keeping a good bed under the animal, plenty of pure air, and the removal of anything that the horse is likely to injure himself against in rolling about. If the symptoms become relieved and the bowels respond to medicine, care must be taken after as to diet; occasionally it ends in metastasis, or shifting of the disease to the eyes or feet. And now, gentlemen, I will not trespass farther on your time. I fear I have not introduced much novelty; but I hope that by the discussion, should any ensue, I may have done a little to contribute to your interest (applause).

A cursory conversation ensued upon various details, and afterwards a cordial vote of thanks was proposed by Mr. Randall, seconded by Mr. Sly, and adopted with acclamation, for the valuable information that had been afforded by Mr. Blake. That gentleman having expressed his acknowledgments for the compliment paid him, the formal proceedings of the evening terminated.

## THE PRINCIPLES AND PRACTICE OF DISINFECTION.

The following document has been prepared by direction of the Lords of the Council. It is headed "Memorandum on the Principles and Practice of Disinfection, as applicable to the present Epidemic of Cattle Disease. By J. L. W. Thudichum, M.D." :—

### "I.—PRINCIPLES OF DISINFECTION.

"1. The term 'disinfection' signifies the removal and destruction, or destruction and subsequent removal of the products of destruction, of all matters actually being or containing products of disease capable of reproducing disease in other animals.

"2. If the same processes and means as used for this purpose are applied to the purification and deodorization of places and things not actually infected, but capable or suspected of being infected, then these preventive measures are practically and properly included under the definition of disinfection.

"3. The reproducers of the infectious matter or contagion are all kinds of cattle of the ox tribe, which also are at present in this country the only animals liable to its specific effects. It is probable that the contagion adheres with particular pertinacity to all secretions and discharges from sick animals. For this reason, feces or droppings, urine, ruminated food, all secretions from the mouth, nose, and eyes, and any sore parts of the surface of the diseased animals must be considered as the principal and primary carriers of the infectious matter or plague poison. It is also probable that many parts of animals which have died from the cattle plague, or have been killed during advanced stages of the disease, are infectious, some because they are primarily imbued with the contagion, others because they have been in contact with it after the death of the animal. Skins, hides, hair, horns, and hoofs must therefore always be treated with precaution. The chances of infection by flesh, fat, cleaned guts, and blood are, perhaps, more remote, but cannot be lost sight of.

"4. The cattle plague, although affecting every part of the animal, shows its visible effects most extensively in the intestinal canal. It is believed, and apparently upon good grounds, that the intestinal discharges are the principal agents,

upon the distribution of which mainly depends the spread of the disorder.

"5. It follows from the above that all articles which have been in contact with a diseased animal, or any of its discharges, particularly feces, are capable of carrying the infection for an indefinite time, and must be looked upon as being actually infectious to other healthy animals. Such are racks of wood or iron, cribs or mangers of wood, iron, or stone; articles used for fastening animals, leather collars and straps, ropes and chains; all harness of any animals used for drawing, and all carts, waggons and carriages which they have actually been drawing; the stalls or sheds in which animals have been standing; the whole lengths of the gutters and drains through which their urine has been flowing; the entire surface on which their manure has been drawn, and all implement with which the removal has been effected; the entire dung-heap, upon which infected manure has been put, and the fluid contents of the manure pit or the special receptacle for the urine; yards or sheds in which cattle have been kept to tread down long straw, and the whole of such straw and manure, as also the ground beneath them; paths and roads upon which diseased cattle have walked or been carried; fields and meadows upon which they have been grazing; all carts, carriages, trucks, and railway trucks in which diseased cattle have been conveyed, and all the platforms, railings, bridges, and boards upon which they have been moved thereto; as also all apparatus which has been used to pen, tie, lift, haul, lower, and fix them; the clothes, and particularly shoes and boots, and impointed sticks of drivers and their dogs; the apparel of all cattle-herds or attendants, particularly their shoes and boots; the shoes and boots of all persons visiting places where diseased cattle are or have been standing; and in general the clothes of all persons visiting infected places, ships, and all parts of the platforms, stages, stairs, and bridges, hoists and cranes used for embarking and landing the animals; markets and all sheds and pens and implements used in contact with cattle; slaughterhouses, and all persons and implements in them which have been employed upon sick cattle, as also sundry parts or organs which come from sick animals killed at slaughterhouses; knackers' yards, trucks, or carts, horse-men, and implements which have been employed in the disposal of sick or dead animals; wells and ponds from which



diseased cattle have been drinking, or into which any portion of their excreta has had any opportunity of flowing directly or indirectly; all fodder, grass, hay, straw, clover, &c., and particularly remnants of fodder upon which diseased cattle have been feeding; and, in general, all persons, animals, places, buildings, and moveable things which have been in contact with matters proceeding from diseased cattle, or with such diseased cattle themselves. To the above-mentioned places and things any of the processes and agents enumerated and described in the following may have to be applied.

## "II.—PRACTICE OF DISINFECTION.

"A. Disinfection by Earth.—1. Burying.—All matters that can be buried, so as to remain covered with a thick layer of ground or earth, are innocuous. The ground chosen for such interment should be dry. The quickest, and cheapest, and most certain way of disinfecting an animal dead from the plague is to bury it entire.

"2. The droppings and all straw and other matters contaminated therewith may also be buried into ground where they are not likely to be disturbed for a long time. The places from which such droppings have been removed to be cleaned and disinfected, as will be described below.

"3. Manure heaps and the down-trodden manure of cattle yards, if they have become infected by even a small quantity of the droppings of a diseased animal, should be carefully shifted to a suitable piece of ground, and there be transformed into compost heaps. A layer of manure one or two feet in thickness should be covered all over with six inches of dry earth, ashes, and mineral rubbish: upon this another layer of manure may be placed, and then again a layer of earth, and so forth, until the whole of the manure is stacked. It should be covered all over with a continuous layer of earth of from six inches to one foot in thickness. If the manure-heap or yard manure cannot be shifted, it may be covered on the spot with a layer of dry earth, after which all animals are to be kept away from it.

"4. If the floor of any shed or stable in which diseased cattle has been standing is not constructed with special watertight and impenetrable material, it must be assumed to be infected to the depth of at least six inches. This ground should therefore be removed, together with any stones, pavements, or woodwork which may have been in contact with it, carted to a piece of dry land, and buried. Half-rotten wood is a particularly favourite carrier of infection. Mortar, bricks, loam, or any other lining of the sides of a pen in which a diseased animal has been standing, should be broken out and buried.

"B. Disinfection by Fire.—1. Burning.—All infected articles of a minor value, or made of combustible materials, can be disinfected by exposing them to a heat which will char organic matter. To this class of articles may be reckoned racks of wood or iron; cribs or mangers of wood, iron, or stone; leather collars and straps, ropes and chains; dry manure, residues of fodder from which diseased cattle have eaten; and all such small articles of little value which can easily be replaced by new ones. Chains may be exposed to a dull red heat; all other articles may be heated over a fire of coal, brushwood, or straw, until well scorched. All new articles of ironware should be bought in a galvanized state, to prevent the formation of rust, the accumulations of which form convenient seats for infectious matter; and for the same purpose it is desirable that iron articles which have been disinfected by heat, as above, should afterwards be either galvanized or, at least, while hot, be treated with resin, to cover them with a durable varnish, or should be varnished or painted.

"C. Disinfection by Chloride of Lime.—Chloride of lime or bleaching powder, is the most powerful, the cheapest, and most easily managed of all artificial disinfectants. It can be had everywhere, and at any time, and in quantities sufficient for every purpose. It should, as much as possible, be applied in solution, of a strength varying somewhat with the particular purpose for which it is to be employed; and, after it has been allowed to act upon the surface or matter to be disinfected a reasonable time, should be washed off, together with all products of decomposition. As chloride of lime does not destroy only the infectious matter in a mixture, but destroys all organic matter without distinction, it is not applicable to large quantities of matter, such as the manure of cattle, dung-heaps, &c., inasmuch as twice or three times the weight of

these matters of chloride of lime would be required for their effectual destruction and disinfection. It is further inapplicable to all matters rich in ammonia, particularly putrid urine, as it destroys the ammonia, and evolves a large amount of gases, some of which have a repugnant odour, and are perhaps not quite innocuous. But for the disinfection of surfaces of things and places, no better or more suitable agent than chloride of lime is at present known to science.

"D. Special Directions for the Disinfection of Stables, Sheds, Vans, Railway Trucks, and Cattle Ships, and of Persons and Things connected with them.—1. After such a place has been cleaned by mechanical means, scraping, &c., as much as possible, and all manure and dirt has been carefully buried, the entire surface which has been contaminated, or is likely to have been contaminated, should be covered with a layer of chloride of lime in powder. The powder should be worked about with a broom until equally distributed. It is intended to disinfect the water to be used in the washing process which is now to commence. Clean water from a hose in which it flows under pressure, or from a force-pump, garden-engine, or from large watering-pots, or water-cans, or poured freely from buckets, should now be applied to the entire surface by one person, while another at the same time scrubs the entire surface, and particularly all crevices, joints, and irregularities. The washing water and chloride of lime are then to be worked down the gutters into the sinks, cesses, or natural watercourses. No washing water from any infected place or thing should ever be allowed to flow into any cesspool, urinal, dung-heap, pond, sewer, or natural watercourse, without having previously been mixed and stirred with a liberal amount of chloride of lime. When the place has thus been scrubbed, until the water flows off clean, it is ready for effectual disinfection.

"2. For this purpose a solution of chloride of lime in water, in the proportion of one pound of the powder to one gallon of water, is made. For the lair of one animal from six to ten gallons of such fluid should be prepared. This fluid is now distributed over the whole surface to be disinfected, gradually by squirting from a syringe, or by pumping through a force-pump, garden-engine, or by watering from a watering-pot or can with a finely pierced rose. All wood-work, stones, bricks, cement, mortar, all fixtures of whatever material, should be well wetted with the solution and immediately be scrubbed with a hard brush. Floor and ceiling are also scrubbed, and the whole is left in this wet state covered with the chloride of lime solution for at least one hour, during which time care is taken that no parts become dry.

"3. As the chloride of lime and the products of its decomposing action upon infectious matters may be hurtful to cattle, these matters have to be carefully washed off by a second and final flushing. For this too much water and too much scrubbing cannot be employed. Care should be taken to apply the clean water always to the highest parts, so as to cause it to flow thence to the lower parts, and to wash away the waste from the lower parts before applying any fresh water to the upper parts.

"4. Care should also be taken to rinse and flush every broom which has worked away sediment and waste from the lower parts into and through the gutters and drains before applying it again to the clean upper parts. Care should also be taken that the working persons should not step from the dirty or partially-cleaned places on to the clean ones, as this may suffice to bring infection back to the disinfected place.

"5. Lastly, all persons employed in this work, having swept and flushed the gutters with the same care as the lairs, are collected, together with all the engines and tools which they have used, as near as possible to the sink or place of final egress of water from the premises, and there disinfected as will be described.

"The tools, such as hooks, forks, spades, hoes, barrows, &c., are scrubbed with the above solution of chloride of lime, and subsequently water, until clean; they are then repeatedly wetted with the solution, and after it has had time to disinfect the entire surface of them they are washed clean and laid up or hung up to dry.

"The workmen then, having finished the disinfection and flushing of all objects and surfaces, effect their own disinfection in the following manner: They wash their boots most carefully with chloride of lime and water, scraping the soles and

scrubbing the seams where the soles join the upper-leather. They wash their hands and arms, and by means of clean rags or sponges they remove any splashes from their clothes. After this they go indoors, remove all clothes from head to foot, wash their bodies, and particularly their hands, faces, hair, and feet with plenty of soap and water, and put on fresh clothes and linen. The clothes and linen which they have taken off should be treated as infected, set to soak immediately in boiling water, and afterwards disinfected, or in water containing two ounces ounces of chloride of lime to the gallon in solution, or containing four ounces Condry's red permanganate of potash fluid in solution; or the clothes and linen should be put in a copper and boiled, and subsequently washed. All articles of little value which are much soiled should be burned on a bright fire.

"E. Disinfection of Live Stock.—1. Live cattle may carry infection in two ways—first, by being themselves infected with the plague, and reproducing the poison; and, secondly, by accidentally carrying the poison from other animals in a dormant state upon some part of their surface, their hair, and particularly their feet. These latter animals may therefore infect others without being or becoming themselves subjects of the plague. All persons, therefore, buying new animals should disinfect them before allowing them to enter their premises. In a similar manner, if in a stable there has been a case of plague, the healthy or apparently healthy animals should all be disinfected.

"2. The mode in which live animals may be disinfected consists in washing them with disinfectant solutions of such strength as will destroy the contagion without injuring the surface of the animal. A solution of two ounces of chloride of lime in a gallon of water is a proper solution for washing the coat of animals. A mixture of four ounces of Condry's red permanganate of potash fluid, with one gallon of water, is also a proper disinfectant solution. For full-sized cows and bullocks &c., several gallons of either of these solutions should be used. Great care should be taken to keep the solution away from the eyes, nostrils, mouth, and tender parts. When the entire surface is washed and disinfected, all disinfectant is removed by the application of great quantities of clean tepid water to all parts. The animal is given a warming and refreshing drink, and is conducted by a clean attendant to the clean quarantine shed. There it should receive fodder, both dry and green, and sop, and plenty of pure cold water, and be rubbed dry with whisks of straw and hay.

"F. The Quarantine Shed.—1. The quarantine shed is intended to keep the new and suspected cattle separate for a period of at least ten days, in order to afford the security—to be obtained by observation alone—that it is not actually infected with plague. While, therefore, disinfection of the surface of cattle removes one kind of danger, another (which cannot be removed) can only be kept circumscribed or penned in, and this is done by the quarantine shed. But the keeping of cattle in the quarantine shed would not disinfect its surface with certainty even during a much longer period than ten days. Disinfection of the surface, therefore, cannot supply the precaution of the quarantine shed; and a rigorous quarantine cannot supply the effect of surface disinfection. Both precautions are necessary for perfect security, although either of them, without the other, obviates a particular kind, and a certain amount of danger.

"2. The quarantine shed should be situated in an isolated part of the premises. All manure and urine from it should flow and be carried to a particular place separate and distant from the common dunghheap, and be buried daily.

"The utmost cleanliness should be observed in the shed. All tools, pails, currycombs, &c., used in this shed should be used in it exclusively and nowhere else. The person attending the quarantine shed should not be allowed to go into the shed where healthy stock is kept, or permitted to approach healthy stock. No person attending healthy stock should be permitted to approach quarantine cattle, or to go near or into the quarantine shed. But should unfortunately only one person be available for both duties, that person should be allowed to approach quarantine cattle only when clothed in the safety-dress immediately described.

"G. The Safety Dress.—1. This consists of strong water boots reaching up to the knees, well greased all over; of a waterproof coat, buttoned close all the way up in front, and closing tightly round the neck and wrists. The head is to be covered with a cap which takes the air well in.

"2. Every person having occasion to visit sheds in which there is diseased cattle, or suspected cattle, or quarantine cattle, should be provided with the above dress: put it on when entering the place, take it off when leaving the place, and have it disinfected immediately. This precaution should be strictly observed by all inspectors, all veterinarians, or others called in to attend sick cattle, by all dealers and butchers entering sheds, yards, or meadows for the purpose of sale or purchase, and by all other persons coming on the premises on business in connection with cattle.

"3. The owners of stock should not allow any strangers to enter their sheds, yards, or meadows, except in disinfected safety-dresses; and in case this should give rise to difficulties, they will do well to have themselves one or two such safety-dresses at hand, and to cause all persons whose business compels them to enter their sheds to leave their own boots behind, and to put on the long boots, waterproof coat, and special cap. Only thus can they hope to exclude all ordinary and obvious chances of infection from their previously healthy sheds, yards, and meadows.

"H. Measures to be Taken on Premises where Plague has actually appeared.—1. When the plague has actually appeared in any shed, yard, or place, the sick animal should at once be removed with all due precautions. It is certainly the safest and best to poleaxe the animal at once, and to bury it entire, and then to disinfect the particular lair as above described, clear out the stable or shed, disinfect the whole of it, and all the apparatus, also all the animals, and only to let the animals enter the shed, &c., again after it is completely swept and dry.

"2. If, however, a proprietor is desirous of keeping a sick animal because its illness does not appear severe or fatal, he should place it in a separate shed, which must not be the same as, or near to, the quarantine shed, and be distant from all healthy animals, and so situated that the prevailing wind does not blow from this hospital shed towards the healthy or quarantine shed. The water should also not flow from this hospital shed towards the others, or the yard, or any meadow, but should be carefully drained away and sent off the premises by a special sink.

"3. To prevent the scattering of feces by infected animals (and also by suspected animals and all animals suffering from diarrhoea), their tails should be so tied to one or other of their horns as to protect them against being soiled by the intestinal discharges, and to prevent them from distributing such discharges by the ceaseless motion peculiar to these organs. The spattering of feces should be prevented by a copious supply of rough straw, with some sand, sawdust, or ashes placed behind and underneath the animal. The straw and feces should be dealt with as has been described. Animals affected with plague or diarrhoea should not be led along streets, highroads, and paths, as they would be certain to drop infectious feces, which would then be distributed over the entire length of these roads by the feet of men and animals, and the wheels of vehicles.

"4. The sick animals should be disinfected repeatedly; their pens should be cleaned and disinfected repeatedly during the course of the illness. This should be done by persons either guarded by the safety-dress, or—and this is safest—by such as may not come into contact with healthy cattle, or have to enter healthy sheds. All tools, pails, fodder, &c., to be used in the hospital-shed to be kept for that purpose only, and never to be used with healthy, or quarantine, or only suspected cattle.

"5. If the proprietor of any dead piece of cattle, whether it has died naturally or been killed, should decide upon dismembering it instead of burying it entire, and upon utilizing the hide, horns, tallow, and bones, he should disinfect the skin, horns, and hoofs, by steeping them for one hour in a strong solution of chloride of lime, containing one pound of the powder in each gallon of water, and afterwards washing them. The tallow should be thickly powdered with chloride of lime all over, and be sent directly to the boilers. It should not be boiled in any vessel employed on the farm. Under all circumstances, it is advisable to let this dismemberment of dead and fallen cattle be performed at the knacker's yard.

"6. Flesh, blood, guts, lungs, and the bones of the head of infected animals should not be trafficked with, as they cannot easily be disinfected. They should always be buried.

"1. Disinfection of Meadows, Fields, Roads, &c. — 1. Meadows infected by diseased cattle should be carefully cleaned of all dung, by burying each dropping on the spot where it lies, cutting out the round piece of turf with the dropping on it, and turning it upside down. The grass on the entire meadow should then be cut and burned. It should then be left without any cattle for at least a month, including at least two wet days.

"2. All roads, paths, streets of towns, or villages should be carefully and frequently scavenged. All carts, vans, or waggons used for carrying manure should be watertight, caulked, and painted, and should not be permitted to ooze and drop their fluid or semi-fluid contents on the road over which they are drawn. They should be kept clean and disinfected, as a precautionary measure, by the proceedings above described.

### " III. GENERAL RECOMMENDATIONS.

"In conclusion, it must be pointed out to farmers, dairy-men, and all persons having charge of cattle,

"That the same great measures which are known to maintain and restore the health of human beings will also maintain and restore the health of cattle.

"Pure air; dry, spacious, well-ventilated and well-drained clean sheds; clean and dry meadows; plenty of pure water; frequent carrying and washing; the prevention of the development, by the destruction of the germs, of internal and external parasites, particularly entozoa; proper food in suitable quantities, and at proper times; protection from inclement weather; the utmost cleanliness in the removal of manure; the storing of the manure at a great distance from the cattle-shed, and, in addition, the most conscientious observance of the precautionary and disinfecting measures above described—all these measures and agents together will secure the utmost possible health of stock, and the prosperity of the agriculturist and dairyman. But the neglect of any one of them will make the stock liable to become infected, and the more so the more several or all collateral conditions of the healthy existence of animals are neglected. The negligent man is, therefore, certain to lose, to injure his neighbour by defeating his precautions, and to damage society; but the watchful and painstaking man will be rewarded, not only by the preservation of his property, but particularly by the consciousness that it has been preserved by his own care and attention, and that thereby he has also benefited the State."

## THE CATTLE PLAGUE.

The following address has been issued by the Veterinary Committee of the Royal Agricultural Society of England:—

The gradual extension of the cattle plague in different parts of the country, together with its appearance in localities hitherto exempt from it, induces the Veterinary Committee of the Royal Agricultural Society to call upon its members to co-operate with the Government, and with other agricultural societies, in the efforts which are being made for suppressing the disease.

The existence of this disease being regarded as a national calamity, it was right that the Government should take the initiative in adopting means for its suppression; and their having done so leaves little for the Royal, or any other Agricultural Society, to do, except to second the efforts of the Government.

The several orders in council which have been put forth, well calculated as they are to arrest the progress of the malady, will, nevertheless, prove non-effective to a considerable extent unless they are backed by individual exertion. One of the chief, and in many instances the only cause of the extension of the disease into several fresh districts, has been the reckless manner that many persons have dealt with infected cattle. Not only have these been driven from place to place, and turned into fields separated only from large herds of healthy animals by an ordinary fence; but many have been sent to fairs and markets, and thus, by commingling with others, have spread the disease far and wide. All preventive measures are thus rendered of little avail; and unless practices of this kind are prevented by the vigilance of agriculturists and others, thousands of cattle will be lost to the country, in addition to those which have already perished. Everyone should be impressed with the fact that the disease is the most infectious as well as the most fatal which is known to affect cattle, akin in its deadly effects to the smallpox of sheep, but not giving warning to persons by an eruption upon the body. Like smallpox of sheep, also, the poison lies latent in the system for several days after being inhaled, and during this time the animal gives no indications of being affected, so that the most cautious persons may be deceived in the making of purchases. Another fact of equal importance, but not generally known, is that the special poisonous material, or infectious matter, on which the disease depends for its existence, is multiplied, to an extent scarcely to be estimated, in the system of every fresh victim; so that it is quite possible for one diseased animal to be ultimately the cause of the death of thousands. The veterinary committee conceive, therefore, that the precautions which have been put forth by the society's veterinary inspector will not be inaptly repeated here, although they have been previously brought to the notice of the members of the society through the ordinary channels of publication.

These precautions are:—

1. That all persons should abstain as much as possible from the purchase of "store stock" in fairs and markets, and should not purchase from cattle dealers without a warranty against the disease.
2. That all newly-purchased cattle of every kind be kept apart from others for a period of not less than twelve to fourteen days.
3. That cattle, the subjects of this disease, should not be allowed to remain in any meadow or pasture field, unless they can be perfectly isolated from all other animals, as well as kept at a distance of not less than a hundred yards from all roads along which sound cattle may be driven.
4. That every animal, which is violently attacked with the disease, be killed and buried without delay, and that the skin be placed in some disinfecting fluid before being sent off the premises.
5. That no animals be allowed to go near to the burial-places until several weeks have elapsed.
6. That no person who has the charge of the sick cattle be allowed to go near the healthy ones, and that all indirect communication by dogs or other animals between the infected and the healthy cattle be strictly prevented.
7. That all healthy cattle after removal from the diseased be well washed and cleansed.
8. That no fodder or straw which has been used about infected cattle be taken to other animals, or even thrown into the fold-yard, or upon the manure-heap, until it has been first well incorporated with chloride of lime, or some other disinfecting powder. When practicable, it is desirable that all such fodder and straw should be burnt.
9. That all manure in the sheds or stables occupied by diseased cattle be daily sprinkled with some disinfecting powder, and that no evacuations of the diseased be removed without being first disinfected.
10. That all sheds and stables, in which diseased cattle have been located, be thoroughly washed, cleansed, and ventilated, and likewise disinfected by whitewashings with quick lime, before any other cattle are placed therein.
11. That all railway cattle-trucks, station-pounds, ships used in the cattle trade, wharves and other places, where cattle are brought together, be kept as clean as possible by frequent washings; and that disinfectants be used whenever there is reason to believe that they have been occupied by diseased animals.
12. That no store-stock, milking cows, or cattle of any kind which have been exposed to the influence of the infection, by being located with the diseased, be sent to any fair, or market, in less time than a month after such exposure.

13. That in all cases in which it is determined to slaughter animals which have been on a farm or premises where the disease has broken out, but which animals are believed at the time to be healthy and fit for human food, they be sent with all due care and caution direct to the nearest slaughter-house, if not killed on the premises, and as a further precaution their skins be placed in some disinfecting fluid.
14. That, although experience has shown all animals of the ox tribe, whatever may be their age, sex, or condition, to be susceptible of the action of the infection, it is nevertheless essentially necessary that every cause which tends to weaken the constitution should be carefully avoided. Protection from inclement weather, supplying animals with nutritious food, such as cake or corn, and especially with pure water, are imperatively demanded at a juncture like the present.

In addition to a strict observance of these precautions, the committee would remind the members of the necessity of recognizing the early symptoms of the disease, and not confounding them with those belonging to other maladies common to cattle. For this purpose they here insert the leading symptoms of the cattle plague, and of the two other epidemic affections to which cattle are subject :

#### THE CATTLE PLAGUE.

The early symptoms of the plague are usually a *remarkably dull and dispirited condition* of the animal, which will stand with its head hanging down, ears drawn back, and coat staring, refusing all food, and occasionally shivering. The eyes have an unusual expression of anxiety, and a mucous discharge flows from them, and also from the nostrils. The skin is hot, but sometimes chilly; the temperature varying from time to time. The extremities are cold; the breathing short and quick, and frequently accompanied with moaning as an indication of pain. The inner part of the upper lip and roof of the mouth is reddened, and often covered with raw-looking spots. The bowels are occasionally constipated; but, in most instances, diarrhoea soon sets in, the evacuations being slimy and very frequently of a dirty-yellow colour. The vagina is often intensely reddened. The prostration of strength is great, the animal staggering when made to move. *In milch cows the secretion of milk is rapidly diminished, and soon ceases altogether.*

#### PLEURO-PNEUMONIA, OR LUNG-DISEASE.

The attack is mostly insidious, the animal appearing at the outset to be but little affected. The eyes retain their brightness, often to the termination of the illness. The appetite is generally diminished, but rarely lost, excepting in the advanced stages of the disease. A short, dry, husky cough is one of the earliest symptoms: it continues throughout, and is easily excited by moving the animal, especially if such movement is sudden. There is rarely any discharge from either the eyes or nostrils. The breathing is greatly increased, and becomes painful as the disease advances. A dull sound is emitted on gently percussing the side of the chest over the diseased lung. Firm pressure applied to this part will also cause the animal to shrink. There is little or no alteration in the fecal evacuations, excepting in the last stages of the malady, when a diarrhoea comes on. The warmth of

the body and the extremities is often retained to the last hours of the illness. In milch cows the quantity is increased; but the animal will frequently yield a fair quantity to the very last. The affected animal will sometimes live for weeks.

#### THE MOUTH-AND-FOOT DISEASE.

Attack sudden. No premonitory symptoms, excepting in very rare instances. The animal frequently smacks his lips, and shows by the movements of its tongue that the mouth is the seat of suffering. The saliva flows freely from the mouth, and accumulates also as a frothy fluid around the muzzle. An examination of the mouth shows the existence of large blisters on the tongue, and often on the inner part of the upper lip. They are few in number, and always white in colour. The animal seldom refuses food, but rolls it about in his mouth, and often drops instead of swallowing it. There is little or no disturbance of either the breathing or pulse; nor is the temperature of the body altered. The evacuations are also natural. In many instances the feet are affected as well as the mouth, and blisters will form between the toes, causing the animal to walk tenderly, and frequently to catch up one foot after the other and shake it, as if to dislodge something which was producing pain. In milch cows the teats are occasionally affected with blisters, especially at opening of the milk duct, which lead on in this situation to sores and crusts, and prevent the ready flow of the milk. The disease is of short duration, rarely produces death, and frequently exists simultaneously among the sheep, pigs, and poultry of the farm, as well as among the cattle.

The preceding description of the most prominent symptoms of these several affections will, the committee hope, so far guide the agriculturist that he may at once be enabled to decide on the nature of the disease; but in any case in which a doubt may exist, he should lose no time in calling to his assistance the professional aid of a veterinary surgeon.

The committee would further observe that they have witnessed with satisfaction the formation of mutual protection or compensating societies in some of the counties in which the disease has broken out. Such societies must prove important auxiliaries to the means employed for suppressing the disease by inducing persons to give immediate notice of its appearance, and by doing all they can to carry out the rules and regulations herein named, as well as the several Orders in Council which have been issued by the Government.

In conclusion, the Committee have to state that, although strongly believing that it is to preventive and not curative means the country must look for the extermination of the cattle-plague, they have not neglected the important subject of combating the disease by medical treatment. In conjunction with the Royal Veterinary College, measures have been adopted by which diseased cattle are admitted into the Infirmary of that institution for treatment. Hitherto, the results of medical treatment have nowhere been so satisfactory as could be wished; but should a successful mode of treatment be discovered the same will immediately be made public. Another and a very great advantage arising out of diseased cattle being brought to the College is, that means are afforded to veterinary surgeons—who arrive in London from all parts of the country, and even from foreign states—of seeing the disease in its several stages, and also of being present at post-mortem examinations, and learning from the professors the whole of the details of the treatment which has been adopted.

## THE CATTLE DISEASE.

There is a cloud since last autumn, which I fear is coming up with the wind and will be soon above us; and that is the cattle disease. I have taken much interest in watching this disease, because I have been connected for many years with the governorship of the Royal Veterinary College, and I can assure you that every exertion has been made in order to ascertain the best mode of treating the cattle attacked with that disease. The principal of our college, Professor Spooner, is now at Vienna, to confer with the men of veterinary science from all parts of Europe, in order to ascertain what may be the best remedy and treatment. Professor Simonds, our second professor, is at work under the direction of the Privy

Council; and Professor Varnell, our third professor, was in college the last time I saw him, engaged in the preparation of additional boxes for the purpose of providing sufficient accommodation. Gentlemen, perhaps you will forgive me if I touch upon this subject rather more fully, for though it is a cloudy subject, still it is one that presses upon the interests of every man present. We saw that many of the stalls were vacant to-day. I do not say that those are unnecessarily prudent who have withheld their stock, because I fear we have to deal with a disease which is comparatively new in England. I was not satisfied with the veterinary opinions as to what this disease really is. There was a concurrence of opinion

that it was the German rinderpest; but I requested an eminent medical friend of mine, who is a member of the Epidemiological Society of the medical profession—a society devoted to tracing the causes, the phases, and the nature of disease—I requested this friend to ascertain at the last meeting of that society what was the general opinion of the medical profession as to the nature of this disease. Well, I touch upon this subject because if we do not know the nature of the disease it is impossible for us to guard against it as we should, and it is impossible for veterinary surgeons to treat it as they ought; and I will quote, without naming him, what my friend reported to me: "From all I can learn (he writes on the 5th of September) among my colleagues at the Epidemiological Society, this cattle disease is considered to be the rinderpest of the Germans, or, as we call it, the steppe murrain. It is an affection of the whole mucous membrane, of a specific character, which requires stimulants for its treatment." Forgive me for having given you the result of these inquiries; for, after all, the first object of this Association is business, and the first business we have to deal with at present is a knowledge of the disease which threatens us, and, secondly, the means of prevention and the treatment which should be adopted. Well, gentlemen, I know it has been said that the measures recommended by the Government are severe. I am an independent member as you know—no tied supporter of the Government; but I believe the measures adopted by Government have in a great measure stayed the plague. And I think we ought to be grateful to Government for the measures they have adopted, because, and I say it with full knowledge, the nature of this disease has been so imperfectly understood on the continent by the veterinary profession, the treatment of it has been so difficult, owing to the rapidity of its progress, that as yet the veterinary science has not been able to suggest any treatment which the Royal College has ventured to commend for general adoption. The Royal College, represented by Professor Simonds in England and Professor Spooner at Vienna are hard at work, and they concur with the medical opinion which I have cited, that the first treatment of this disease as typhoid should be stimulants. Forgive me for having touched on this subject, but I wish to back the judicious recommendation of Lord Leigh in regard to insurance. In foreign countries it has been found necessary to draw a sani-

tary cordon around districts in which this disease has prevailed, and to hem in within the sanitary cordon not only the cattle, but those who were engaged in their treatment; and I cite this in order to urge you whenever the disease may present itself at once to separate the diseased animals from the others, and if you would treat them, treat them apart. I am convinced of this—that we must look to the prevention rather than the cure of a disease which runs its course in twenty-four hours, and which does not therefore admit of the treatment which should follow on the use of stimulants. Therefore we must look to stimulants, and it seems to me, as time is drawing on, that every farmer should look to the condition of his cattle-sheds. Use all cleanliness and disinfectants. You will excuse me for going into detail, but I speak on the authority of several veterinarians. There is one measure which is essential. You must break the change which must occur in the health of the animals caused by the removal from pasture to the cow-shed, and render that change as gradual as you can, so that the health of the animal may be as little as possible disturbed. I again ask you to forgive me for troubling you on these matters, but I have been for twenty years governor of the Veterinary College, and for many years chairman of the governors, and I thought I could not do you a better service than to render you thus briefly the result of their experience and advice. After all, although it may be doubtful whether it is prudent that the cattle should be congregated together, even for such occasions as the present, there can be nothing which should prevent the owners of cattle meeting as they have done to-day. On the contrary, there is every reason that you should meet. The less desirable it is that the cattle should be congregated together on account of the prevalence of this disease—which I trust may be stayed by the preventive measures which your own good sense may suggest, in accordance with the dictates of the Privy Council—there is the more reason that you should meet. It is necessary that you should ascertain the localities in which the disease prevails; and above all, it is in such meetings that you combine those means of mutual assurance which are essential to the prevention of disease; for if there is no mutual assurance, if there is no organized system for compensation against loss by this disease, depend upon it there will be an unwillingness to comply with the preventive measures.—*Mr. Newdegate, at the Stratford-on-Avon Meeting.*

### SMITHFIELD CLUB CATTLE SHOW FOR 1865.

This annual show will take place on Monday, the 4th of December next, and will continue open to the inspection of the public for the four following days, closing on Friday the 8th, at 10 o'clock P.M. Several important alterations and additions have been agreed upon by the council, of whom the Right Hon. Earl Spencer, K.G., is the President, which have met with the general concurrence of the members. There will be eleven distinct breeds of cattle admitted to the show to compete for the moneyed prizes and medals. These will include Devons, Herefords, Shorthorns, Sussex, Norfolk, and Suffolk polled, Long-horned, Scotch horned, Scotch polled, Irish, Welsh and cross and mixed-bred cattle. These will be arranged under thirty-four separate classes. To the five classes of Devon beasts sums amounting to £250 will be given, with a silver medal to the breeder of the best animal shown in each class. A similar sum will also be awarded, with a silver medal, on the like terms, to the Hereford and Shorthorn classes. Moneyed prizes of £115 will be appropriated to beasts of the Sussex breed, with silver medals to the successful breeders in each class. To the Norfolk and Suffolk polled classes £50; to the Long-horned ditto £30; to the Scotch horned £45; to the Scotch polled £70; to the Irish ditto £30; to the Welsh £35; to the cross and mixed breeds £125, and a medal to each—making a sum total of £1,270, with thirty-four silver medals, as prizes to the cattle classes, besides two sil-

ver cups of £20 and £40 each. There will be admitted into the show twelve distinct breeds of sheep, viz., Leicesters, Cotswolds, Lincolns, Kentish, long-woolled sheep (not being of the above breeds), Southdowns, Hampshire, or Wiltshire Shropshire, Oxfordshire, mountain-bred, Cheviot or Dorset, and cross-bred kinds, and £545 will be distributed in sums varying from £5 to £20 to the successful exhibitors, whilst a silver medal will be presented to the most approved breeder of stock in each class, and three silver cups of £20 each. There will be four classes of pigs; £30 and a silver medal will be apportioned to the competitors in each class. Six silver cups, valued at from £20 to £40 each, will be adjudged to the several exhibitors of the best steer, heifer, long and short-woolled sheep, as well as also pig, shown in any of the classes; a gold medal also to the breeder of the best steer or ox, as also heifer or cow, shown in any of the classes. Furthermore, distinct money prizes of £5 each, accompanied by a silver medal, will be given to the successful exhibitors of the various animals under extra stock, and three silver cups of £10, £15, and £20 to the butchers who shall purchase the largest amount of cattle, sheep, and pigs. In addition to these prizes, the herdsman, shepherd, or pig-feeder, who has fed and attended the animal gaining the first prize in each class, will be presented with a sovereign and a framed diploma with a suitable inscription.

## CHIPS.

## FARM-YARD MANURE; WATER AND ITS AGRICULTURAL USES.

## INTRODUCTORY.

The traveller, as he wends his way through the forests which line the river banks, or stretch far into the plains of a country which he is exploring, and desirous to bring home with him record of his researches into the natural history of the districts which he traverses, sees with regret stately trees or huge rocks which he would like to but cannot remove. Contenting himself then with what he can get, he breaks a stone here, lops off a branch there, or anon gathers up a chip which the woodman's axe has left upon the ground, and, putting these into his wallet, brings them home as samples of the production of the land he has visited. So, to keep up the simile, the wanderer in the woods—may we not also say the wilds?—of agricultural literature, sees abundant evidence of the wealth of the country around him, and may be struck with the desire to bring home some of its products for the benefit of those who have not the like privilege with himself of wandering amidst "fresh fields and pastures new." But the traveller cannot bring away a tree or transport a rock; he is compelled, therefore, to return with "chips" from them only, and present them to the notice of his friends at home as samples of what the country produces. It has been our lot for a long time to watch with interest the products, so to speak, of the agricultural country, and rich in many things undoubtedly it is, but these are not always to be met with when wanted, being now and then hid deep in the bosom of the earth, stowed away in some cleft of the rock, covered with leaves, or far in the depth of a forest, and it is only those who have a knowledge of the intricacies of the various districts, and of the signs which they afford of the wealth which they contain, that can readily and easily find what could not be perhaps found at all by less favoured explorers. Not in any way claiming or being desirous to claim the position of one who knows the country thoroughly, but contenting ourselves merely with that of one who has some slight knowledge of it, we believe that in our "museum" we have some samples or specimens worth looking at as indicative of its wealth. Time is not given to all to travel, and it is no small pleasure to be able to give to others its benefits without its trials and fatigues. This, we hope, in some modified measure to be able to do. To descend from the imaginative region of simile to the prosaic field of fact, we purpose to give at intervals, and in briefest fashion, essays on various points connected with the theory and practice of farming in all its branches. These will, as a rule, have their origin in the elaborate papers which are scattered here and there throughout the pages of our agricultural publications not much known, or if known not easily got at, and which may, therefore, be said to be new to many readers. We design them to be, as said above, very brief, so that they can be taken up in the spare moments which are much more frequently obtained from the labours of the farm or the cares of the fold than the longer intervals of ease with which few farmers are blessed. Our essays, or what may with more propriety be called essays *à l'essai*, will, when founded upon the elaborate papers above alluded to, bear the same relation to them as the "chips" which fly from the carpenter's axe to the tree or the log which he is fashioning into shape: small relatively, they will nevertheless show the grain of the tree from which they have been hewn.

But we do not purpose to content ourselves merely with giving samples of the labours of others; we may now and then be bold enough to present samples of our own. These will have to be taken for what they are worth, and may be more frequently illustrative of the poverty than the richness of the parcel of which they are samples.

## I. FARM-YARD MANURE.

There is amongst the vexed questions of agriculture—and they are certainly numerous enough—none perhaps on which so much diversity of opinion exists as the treatment of farmyard manure, and its value in different conditions. Some praise long or fresh—some, short or rotten dung. Some hold it should be made or kept in covered yards; some, in open pits; others, again, advocate the utility and the economy of spreading it over the surface well, allowing it to lie exposed for a length of time to the atmosphere and its ever-changing conditions; while this very process is denounced as the most wasteful and absurd of all the modes of treatment which can be devised. Let us gather up a few "chips" from various hands on these points. It is obvious enough that farmyard manure contains certain elements of fertility—nay, it is a universal manure, for it contains all. There must, then—so common sense would, at all events, dictate—be one way in which these elements can be better kept or returned in the body of the manure than another. In this, as in other matters, it is no new thing to say, that there must be a right and a wrong way of dealing with this substance. To illustrate how this may be, it will be necessary to glance at the most important chemical facts connected with the subject. Nor need the reader be deterred by the notice that this will be a dry detail, or a long one—few words will place the whole matter clearly enough before him. Farmyard manure is divided into two parts—organic, or substances which can be burnt; inorganic, or those which are incombustible. The organic substances are made up of carbon, oxygen, hydrogen, and nitrogen; and these form a variety of groups the action of which is most interesting. Of these four substances, nitrogen is almost always in a state of excitement when present in farmyard manure exposed to the air; and the other substance with which it most readily combines is carbon, which in itself is rather disposed to remain inert. The mixture, however, of the nitrogen and carbon of the manure brings at once into existence a remarkably rapid action, which, as Professor Tanner says, "rends asunder the individual elements of the various matters in the dung, and affords them the opportunity of forming new associations or combinations." What they are a brief sentence or two will explain. Air and moisture being present in the dung—as, practically, it is present in all heaps of it—the fermentation caused by the union of the nitrogen with the carbon compounds goes rapidly on, and brings about the disposition of the various elements contained in the manure or forms new combinations: one of these is the union of the nitrogen with the hydrogen, which forms (1) ammonia; next, the union of the oxygen with the carbon, which forms (2) carbonic acid; and the union of the oxygen with the hydrogen and the carbonic acid, which gives (3) humic acid. But these, whenever they are present together, do not remain separate, but combine to form fresh arrangements: thus, the carbonic acid unites with the ammonia, and carbonate of

ammonia (one of the most volatile of compounds) is formed. With the combinations of humic acid and ammonia we have the humate of ammonia, a compound which is not volatile; but although not volatile—that is, not easily passing off from the manure to the air—it is very readily dissolved in water; and the black, rich-looking liquid which we see running from manure heaps is evidence, then, of this dissolving process going on. Hence may be derived the practical value of having the sides and bottom of our manure pits impervious, so that all this drainage shall be kept. Hence also that other recommendation which some authorities insist upon, of having the manure pit covered, so that large quantities of rain shall not be mixed with the manure. It is obvious enough that this solution of humate of ammonia will be better carried on in the soil near the plants which it is to fertilize, than in the manure pit. At all events, it is folly to allow it to run away, as in too many cases it is allowed to run away and be lost. One result of the process of fermentation, which we have shown the cause of, is the loss of weight which the manure sustains; thus 100 cwt. of fresh manure is decreased to 80 cwt. half-rotten, 60 rotten, and 40 very much decomposed. The loss of weight is caused by the withdrawal of carbonic acid, carburetted hydrogen, and other substances, which being of very little value as fertilizers, do not cause much loss of manurial value in fermented manure. Fermentation should not, however, be carried too far; for it is worthy of note, that, as the process goes on, the decaying particles have the power of withdrawing ammonia from the air, and of retaining it till removed by water, or by the decay being pushed further on; so that, if pushed further on, the ammonia escapes into the air—that is, there is more ammonia present than can combine with the humic acid present, which is under these circumstances the case. But the value of dung is not measured by the presence or amount of the organic substances we have named. The inorganic or mineral portions are of the utmost value as fertilizers, or as tending to build up the plants to which it is applied. The value of these inorganic substances has been shown to be fully one-third of the whole value of the chemical ingredients of the manure. These inorganic substances play an important part in the formation of our crops, as will be seen from the numerous analyses of them, which have been published from time to time in the columns of this journal. These inorganic constituents are all present in farm-yard manure; but they are not capable of being taken up by the plants till they are in a state of solution; and the process of fermentation in dung we find “the surest plan of rendering” them available by bringing about this state of solution; for many substances, difficult of solution in water under ordinary circumstances, are readily dissolved when brought under the influence of the fermentative process going on in the manure-heap. The evolution of heat is always one of the results of fermentation, or rather fermentation cannot go on without heat, and this heat is the result of the chemical union of the organic substances which we have already described. The greater the heat the more rapid the decomposition; but this heat, or rather the combination of the compound which causes the heat, cannot be produced without the presence of air and water. But curiously enough, it is in the supply of these in proper quantity that the excessive heat which would otherwise exist in the centre of a manure-heap is kept down; for while we admit these, we open up, so to speak, apertures by which the heat escapes, and the temperature correspondingly reduced. It is difficult to name the exact quantity of moisture with which manure should be supplied; if it is deficient in quantity a very volatile compound—carbonate of ammonia is formed, the carbon having been unable to get hold of a sufficient quantity of hydro-

gen to form the more volatile compound, the muriate of ammonia, which a proper supply of water would secure. Further, this volatile compound, arising from deficiency of moisture, is rapidly passed into the atmosphere through the agency of the excessive heat, which again results from the absence of moisture. Hence, as Professor Tanner says, acids are the greatest sources of loss in the management of dung; for we adopt measures to promote a violent fermentation; and yet we do not supply moisture to render the decomposition most complete and beneficial. “This authority therefore recommends that, after a manure heap has been turned, or, in fact, during any period when the fermentation is vigorous, especial care should be taken to give fresh supplies of moisture, which will powerfully promote the formation of those ammoniacal compounds which are of the greatest agricultural value.” The drainage from the manure-pit will be most useful for this purpose: hence the value of the Continental modes of forming manure-pits, in which there is a special place made, into which the liquid drains, which is pumped up and poured over the surface of the manure. But while on the one hand moisture is required, too much must be avoided: hence if the climate is a very wet one, the manure-pit should be covered. Indeed, our authority says that it will be safer in any case to do this; for it is an easy matter to pump water or the draining of the heap itself over the heap. So far we have considered the making of manure in its original pit; but as this becomes filled, it must be removed. Moreover, the exigencies of farm-labour often render it necessary that in the comparatively idle days of winter the manure should be carted on to the fields, so as to economise time in the busy days of spring, when it is to be used. And here we see the diversity of opinion we in the beginning of the paper adverted to—some advocating the placing of the dung in heaps, carefully made; others the spreading of it out upon the surface. The following is Mr. Lawrence’s mode of forming manure-heaps in the field. He selects three or more spots, in proportion to the size of the farm, by the side of the roads, and in positions the most convenient for carting the manure on to the land. In these places he excavates for about two feet in depth, and on the floor of this he lays some three or four inches in depth of common soil, to absorb the liquid from the manure placed above. The manure is tilted from the carts into the spaces; and it is then spread evenly over the surface, and well trod upon. The filling-in and spreading is carried on till the manure reaches a level of about 12 inches from the ground. From this point it is gradually taken in, so as, when finished, to represent the sloping sides of a roof, the top of which is slightly rounded, this being done by treading on the top. As the successive layers of manure are laid on the heap, salt is sprinkled over the surface, the proportion of salt to the manure being one bushel to the cart-load. In a day or two the heap will sink to what may be called its normal level, when the whole surface is plastered over with moistened earth. Thus prepared, the manure will keep a long time. When the manure-heap in the field is opened, and the dung found to be insufficiently rotted, the whole must be turned over and allowed to remain for ten or fourteen days. But, as Professor Tanner says, we must be equally careful as before to prevent all loss from drainage; and the top should be covered with soil even more freely than before, to prevent the loss from the ammonia escaping. But while preventing all loss from drainage, care must be taken if necessary to give a supply of moisture to the heap, so as to promote fermentation.

## II. WATER AND ITS USES.

The gift of water is one of the most precious of those which a beneficent Creator has supplied to man, the value



of which it is indeed impossible to over-estimate. For whether considered as a necessary element, ministering directly to nutrition, or enabling us to assimilate other nutritive substances, as a means to increase bodily comfort, or to add to bodily health, a plentiful supply of pure water is of essential importance to man's physical well-being, as well as to the animals placed under his care. It would be easy to descant upon the numerous advantages of a plentiful supply of water; but this has been done by other and abler pens than ours. It is a curiously suggestive circumstance, that while so much has been written and said of late years as to the importance of a supply of water to our town houses, little—very little has been said or written on the importance of securing a supply for our country ones. The subject of "water and its agricultural uses" has recently been taken up in the pages of the *Journal* connected with agriculture, and has been discussed with all the full detail which its importance deserves; from these papers we take the following "chips," which will be of interest to our readers, and on the point we have just above alluded to the following will not be amiss. After alluding to the fact that the Sanitary Inspector always confines, or at least almost always confines his care to the towns and cities, over-looking quite the country villages, hamlets, or houses, and that in consequence a large amount of ignorance prevails amongst us as to how matters really are in rural districts, the writer goes on to say, "A search, however, into the circumstances of these rural districts will result in establishing the fact that of these sanitary evils connected with them as striking and as painful as those connected with many of our town districts, about which so many woful Jeremiads have been raised, this of the water supply question is one in connection with which not a few startling evils may be traced. For, in many cases, in rural districts it is easy enough to meet with cottages which have no direct supply of water given to them. Upon their inhabitants is too often entailed the labour—all the more painful, and all the more uncalled for after a day's work at their special calling—of going to some distance from their homes to get a supply of water. Nor is it seldom the case that this supply is quite unfitted for healthy use. The whole subject of water supply to the cottages of our labouring agricultural population is one which has never met with, but most assuredly demands, the earnest consideration and care of those who are mainly interested in the maintenance of their healthy condition." That this consideration has now a chance of being given to it, signs here and there are existent. For example, Professor Voelcker read a paper on "water" before the Royal Agricultural Society, and in the discussion which followed its reading one of the speakers remarked that great interest had of late been manifested on the question of water supply to the houses of the agricultural labourer; and drew attention to a fact which we hope is not true of all, but which we know to be true of too many cases, that circumstances in general seemed so to concur that the same spots upon which labourers were worst housed were also the most unfavourable for a supply of water;" and in concluding the discussion the learned Professor himself said, that "the bad quality of water with which cottages were generally supplied in agricultural districts was really a hardship that pressed with peculiar severity upon the industrious and thrifty labourers." The disease then, being so generally known, and its evils understood, surely the remedy will speedily follow; but alas! how, in these matters, slowly the "we shall" follows upon the "we should!" Not at present going into details of the sources of supply open to use in rural districts, and which require special means more or less expensive, we would here in a sentence or two draw the attention of the reader to that source of supply which is abundant in our climate, and

which can be readily and cheaply availed of, at any time: we refer to *rain-water*. It certainly is astounding how indifferent people are to this heaven-sent gift. Rain water is, without exception, and beyond all dispute, the purest and the softest we can obtain. For washing purposes, both of person and clothing, it is unrivalled. So far as personal use of it is concerned, we make bold to say that once one knows its value, he will go to the use of other qualities of water with the greatest possible reluctance. Of its value for the washing of clothes no one has any conception who has not used it, or is aware of the advantages attendant upon this use. Not only are the clothes better washed, more quickly washed, less quantity of soap required than when harder water is employed; but the wear and tear of the fabric is very much less. All these points are of great importance to all classes of the community; but of the greatest importance to the labouring population, whose means should be economised to the utmost. It has been calculated that by the use of soft rain water while the expenditure of soap in washing a given amount of clothing was 8d., by the use of hard water it was three-fold or 9d., the labour in the case of soft-water being 5s., in hard 10s. The harder the water, moreover, the less "pure" are the clothes, and the more frequently must they be washed, and the greater therefore the wear and tear. On an average, where rain-water is not used for clothes washing, the money spent in washing a shirt during the period of its use is double the cost of the shirt itself, material and making: this calculation is made on the basis of the cost of dear cotton, as it is now: in its normal or ordinary condition, or rather what this was before the panic, five times the cost of the shirt was expended in washing it when hard-water was used. The extent of roofing in our farm buildings being generally very great, a large supply of rain-water can be obtained from this source alone, and it is better to save it and store it up than allow it to drip from the roof and make the walls damp. In London, the amount of water obtained each year from 400 square feet of roof surface has been estimated at 5,000 gallons. Another rule has been given by which an approximative estimate of the quantity of water may be obtained. Reduce the superficies in feet of the roof into inches, and multiply this by 231: the quantity will be the number of gallons obtained during the year for each inch of rain-fall of the district.

**ORANGE TREES AS AN INVESTMENT.**—During the last few years the supply of oranges has been greatly improved in France, and amongst the new or improved sources are Cannes and the Gulf of Juan, in the Mediterranean, nearly the whole neighbourhood of which is being converted into orange plantations. It is said that Paris alone consumes annually about five millions of oranges grown there; and there is a large trade beside in orange flowers, which are the produce not of the sweet, but of the bitter, or Seville orange. At present the price of orange flowers at Cannes is not more than 4d. a pound, but it is said to be on the rise. In good situations a tree 15 years of age will yield about 16lbs. of flowers each year, and in an orangery, by the Gulf of Juan 1,550 trees of 17 years' growth give on an average above ten tons of flowers. Besides the flowers these trees yield a certain amount of fruit, the result of the blossoms which appear after the flower harvest—for the orange tree has a succession of flowers, ripe and green fruit as well as blossoms being frequently seen together on the same tree; and also a third item of profit in the form of prunings and clippings, which fetch 8s. a hundredweight, and are used for the production of inferior scents.—*The Grocer*.

## THE CAUSE OF THE CATTLE PLAGUE.

SIR,—Having read in the daily papers many articles which represent what I may call the general rather than the agricultural opinion on this subject, may I be allowed briefly to point out what appears to me erroneous? The arguments are that the disease is atmospheric, and also promoted by the too luxuriant growth of grass, and by the errors in management, which have caused our stock to become less able to withstand such epidemics; that we have occasioned this and other diseases by greedily seeking for early maturity, by feeding with oilcake, and by manuring our plants with artificial manure; in short, it is evidently sought to be implied that as we have brought the disease on ourselves we ought to bear the burden of it, and that the outcry against foreign cattle is only from a selfish desire to once more gain a monopoly of feeding the British public, which, as foreign cattle supplies one-third of the public food, neither can nor ought to be allowed.

Such are the arguments of the papers, and of the public that take them for oracles. A few brief remarks will prove their error.

In the first place, as London is almost the sole mart for foreign cattle; as mutton is consumed to a still greater extent than beef there; and as this cattle trade does not reach the same extent all through the year—as these foreign cattle are, compared to our own, very small, and many only in store condition—it is evidently most unfair to take one week's supply of the number of cattle, selecting that one in which they bore the greatest proportion to British stock, and thence to argue about the comparative meat supply of Britain. In this respect London, so far from being synonymous with Britain, is only the tenth part; and therefore, even taking into account North American bacon and South American dried beef, the foreigner, I am convinced, hardly supplies one-tenth of the meat supply of London, and not a hundredth part of the rest of England.

Meat is doubtless dear; but the cause of this is very plain. In the first place, from the lowness of wheat for the last few years, the poor man has been happily enabled to compete with the rich in its consumption; and, at the same time, an unexampled drought has rendered it most difficult for the English agriculturist to keep up his stock at the average number, and has compelled him to expend much more in fattening. The almost total failure of last year's turnip crop and of this year's hay and grass has of course had a very great effect in enhancing the price of meat; and now that turnips and grass are more than ordinarily productive, the diminished flocks and the cattle disease render it exceedingly difficult to obtain stock to feed off the produce.

With reference to the argument that the improvements in agriculture have had a tendency to induce the disease from unnatural modes of feeding, and a greater constitutional weakness, I deny it altogether. I argue, and could give proof, that the British islands are the best suited for live-stock of any part in Europe; that their stock is of a stronger and better constitution, that it is fed in a more rational manner, and that it is kept more in accordance with Nature's rules, and therefore is, as might naturally be expected, free from many diseases which the filthy and erroneous systems practised on the Continent bring on this stock. Taking seasons in which corn bears a fair remunerative price, and in which cattle food is of average productiveness, the British agriculturist can (in the absence of widely-spread murrain or disease) fully supply the

wants of the British public at a reasonable rate; but imported diseases, such as sheep-pox and cattle-murrain, of course defeat the plans, put a stop to business, and, in the end, add to the consumers' expense: for instance, now in many counties the cattle trade is paralyzed, and the consumer, fearing to eat beef, adds to the demand for, and consequent price of mutton. I argue that British stock is of better constitution and quality than foreign, and that early maturity has not injured it in these respects. The broad chest, the round barrel, the muscular haunches of our breeds prove this, in comparison with the cat ham, flat sides, and pot-bellies of foreign stock, which too often have the appearance of having been starved during growth, and are, we find, almost impossible to be made fat. Do not we see that our Galloway and Highland cattle, our Herefords and Devons are far more hardy than the Norman, Breton, and Alderney cattle? As to comparison with our pigs and sheep, it is absurd. The foreign have neither the constitution nor the aptitude to fatten. In fact, early maturity, aptitude to fatten, and constitution go together; and it is only when we seek to promote great milking properties in our stock that we are liable to injure their form and their constitutions.

As to the mode of feeding: England, with our numerous small pastures, in which we can isolate the different kinds of animals, the artificial grasses, and the growth of turnips and mangold, by which we can supply green food throughout the year, and our mode of keeping cattle, either in the field in summer, or in open sheds in winter, is so congenial to the health of our stock, that I am convinced there would be little serious disease unless it was imported. Compare it with foreign systems. In Belgium, so often puffed off in comparison with us, the cattle are kept in close buildings all the year, the lung disease causing great devastation. In most parts of France the peasant cultivator leads out his cow or goat to feed on the narrow borders between the allotments. In Switzerland the cattle feed on the mountains in the summer, in winter are shut up in close stables and fed on hay. In Russia immense herds range the steppes in summer, and in autumn are driven in immense numbers to the large cities in order to be killed and preserved in a frozen state during winter, the reserve stock being kept in close sheds, while snow covers the frozen plains. In short, the European system is this: Immense flocks and herds are kept on the mountains and waste plains in summer, so that there can be no careful breeding or selection, and infection has full scope, and in winter shut up in close buildings, kept unnaturally on dry food, as hay and straw, and often, for the sake of animal warmth, in the same building with the human residents. Now, suppose want of fresh air, unnatural food, place left uncleaned, and in many instances the human fellow-inmates suffering from contagious disease, and we need not wonder that, with the alternation of plentiful summer food and winter starvation, foreign stock are inferior in constitution and maturity, and that their sheep bring over the "sheep-pox" to us, and their cattle the murrain.

I do not say but that there are intelligent men on the continent endeavouring to introduce our breeds and improve their own; but while the system there is either one of peasant cultivation or of immense domains, while enclosures are almost unknown, and while the winters over all the north are of such great severity as to compel the unwholesome stabling system, it is absurd to suppose that they can compete with us, or that their stock can be as healthy or as well bred.

W. R.

## ODDS AND ENDS OF FARMING FACTS.

(69) The fact seems frequently to be overlooked that weeds do more than merely occupy the space of land which might otherwise be profitably cultivated: they exhaust the soil *almost* as much as the valuable crops. We say "almost;" for, in the absence of direct experiments upon the point, we only conjecture it; but we may say that the conjecture is well founded. So far as analyses have been carried out, Professor Buckman shows that field-weeds carry off from the soil an abundant supply of alkalies and phosphates.

(70) The extirpation of weeds in pasture-land is best brought about by continual mowing down of their leaves. Let the "fact" be always borne in mind, as the great authority on weeds says, "As the leaves are the lungs of the plant, never in such cases allow the lungs to develop themselves."

(71) A steep for seed-wheat is thus given in a contemporary journal: "Mix one pound of chloride of lime with one gallon of water; after which, let it stand to settle for a short time, and draw off the clear solution. In this steep the seed-wheat for two hours; then drain, and dry with a sufficient quantity of sand and ashes."

(72) Vetches—a capital forage-plant—grow best upon a loamy soil. It is not usually designated a rotation crop, being, like peas, more a "catch" or stolen crop. The best crop for it to succeed is a cereal. Sown in autumn, it is ready to be cut for green food for cattle early in the spring, after which the land may be prepared for a root-crop. The seed should be sown at intervals, in order to secure a succession of cuttings.

(73) The proportion of husk of the bean in pod to the seed is 14 to 86. The average weight of a bean may be taken at 12 grains, and 580.80 to the pound.

(74) The straw per acre of the wheat crop amounts to, on an average, from 3,000lb. to 3,500lb.; of the oat, 2,700lb. to 3,500; of the barley, 2,100lb. to 2,500lb.; of the rye, 4,000lb. to 5,000lb.; of the bean, 2,700lb. to 3,200lb.; of the pea, 2,700lb.

(75) The following are average gross crops of the seed-producing plants of the farm: Wheat, 25 to 30 bushels; oats, 40 to 50 bushels; barley, 35 to 40 bushels; rye, 25 to 30 bushels; beans, 25 to 30 bushels; peas, 25 bushels.

(76) The following has been recommended as a manure for the turnip-crop: Two cwt. of superphosphate, one cwt. of bonedust, half-cwt. of guano.

(77) The kohl-rabi—erroneously termed the "turnip-rooted cabbage"—is held in high esteem by some feeders. Mr. Baldwin, who has experimented on the plant, states, however, that, as a milk-producing plant, he has not found it to be so valuable as some have stated it to be. The true name for it is the *Brassica rapo-brassica*. One great advantage the root undoubtedly possesses is, its power to resist severe frosts. We have had crops of it cut in the severest winter we can recollect; and we found them, after long exposure, as sound as could be. We do not, however, recommend them to be given to the cows in a raw, cold state: they are better cooked.

(78) The kohl rabi requires heavy manuring: 25 tons of dung to the acre is the least which should be given, and to this should be added 6 cwt. of superphosphate and 2 cwt. of common salt. Like all the cruciferous plants, the kohl rabi requires this last constituent; it is essentially a marine plant. The best crops are grown from transplanted plants: 8 ounces of seed will raise

plants enough to stock an acre. The field should be prepared the same as for turnips, in drills, with 27-inch intervals. The plants should be dibbled on the summit of the ridge of the drills from 9 to 12 inches apart. The plants should be transplanted in May, June, and up to the end of July. The seed in the seed-bed should be sown for these transplantings respectively in March (beginning), second week in April, and first week of June.

(79) Stockhardt estimates the amount of nitrogen taken by the hay crop per acre at 69.77, equal to 129½ lbs. of ammonia; Liebig at 56, equal to 104 lbs. of ammonia; and Bousingault at 64½, equal to 119½ lbs. of ammonia.

(80) The following analysis of the ash of turnips is by Bousingault. Potash 41.96, soda 5.09, lime 13.60, magnesia 5.34, phosphoric acid 7.58, oxide of iron 1.23, sulphuric acid 13.60, chlorine 3.60, silica 7.95.

(81) Lupines are much cultivated on the continent; they are considered to be specially valuable for sheep-feeding. The great authority on their cultivation in this country is Mr. Chrisp, who wrote an essay in the *Journal* of the Royal Agricultural Society. The following is an analysis, showing their nutritive properties: Nitrogenous or flesh-forming substances 33 to 36 per cent., carbonaceous or fat-producing substances 32 to 37, woody fibre 11 to 12, water 14 to 15, ash 8 to 4.

(82) In making superphosphate, Dr. Anderson recommends the following proportion of the ingredients: One ton of inch-size bones (that is, bones broken to such a size as to allow them to pass easily through a ring one inch in diameter), ¼ ton of sulphuric acid, 60 gallons (or ¼ ton of boiling water). The following is the way of making it: The cistern should be made by preference of lead, or strong wood, and a watering vessel of lead. The bones should be spread in small quantity upon the bottom of the cistern, and the acid gradually poured in upon them from the watering vessel, and at the same time a quantity (proportionate to the acid) of the boiling water.

(83) The following experiments—the results of which show the value of weeding—are reported in the *Journal* of the Bath and West of England Society. 1. Seven acres of light gravelly soil were fallowed and sown broadcast: one acre was measured, and not a weed was pulled out of it; the other six were carefully weeded. The unweeded acre produced 18 bushels, the six weeded acres averaged 22½ bushels per acre, a clear gain of 25 per cent. 2. A six-acre field was sown with barley in fine tilth, and well manured. The weeding, owing to a great abundance of charlock, cost 12s. per acre. The produce of an unweeded acre was 18 bushels, of the weeded 28 bushels, thus showing a difference of 15 bushels per acre, besides the enormous advantage of having the land cleaned for the succeeding crop. 3. Of six acres sown with oats, one acre ploughed out well, and unmanured and unweeded, yielded only 17 bushels: the rest ploughed three times, manured and weeded, produced 37 bushels per acre.

(84) Vatel, the great veterinary of the continent, states that the rate of pulsation of the different domestic animals of the farm is as follows: The horse, 32 to 35 pulsations per minute, an ox or cow 25 to 42, a sheep 70 to 79, the ass 48 to 54, goat 72 to 76, the dog 90 to 100, the cat 110 to 120, the rabbit 120, and guinea-pig 140; of fowls, the hen 140, the duck 135.

(85) In dibbling wheat, experience has shown a good distance between the rows to be 9 inches apart, and the holes 9 inches in the rows, thus making a series of 9

6 inches square. We have found 12 inches square to give the best results, although we have seen it stated that 5 inches square are the best. This, we should say, is too small. The depth of the holes should not exceed, nor be less than, 3 inches. The number of grains to put into each hole has been disputed: certainly the minimum is two, but three is a usual number. At 5-inch distances a good dibbler should with three droppers get over half an acre per day.

(86) Onions are said to be an admirable food for fowls, or rather an adjunct to their ordinary food. If given regularly, it is said that they will prevent the attacks of the more ordinary diseases of poultry.

(87) Meat is said by some authorities to be an essential food for poultry, especially in the winter, when they cannot get the worms they pick up in summer. Others, again, maintain that the habit of giving meat to poultry is productive of grave evils—the cause of many of the worst forms of disease which affect them. By these authorities it is called an unnatural food, inasmuch as the digestive organs of the birds are not fitted to assimilate it. There must, we think, be some mistake in all this; for we know of a surety that fowls do eat when they can

get it, and entirely of their own accord, an enormous quantity of animal food: here it is not cooked; the game found in nature's garden is raw. If meat is an unnatural food for poultry, they certainly have a most unnatural appetite for it. Throw in *one* lump of meat amongst a lot of fowls: if not literally a *bone* of contention, it is something vastly like it, so eager are all to get a grab at it.

(88) We believe the habit of giving much food in a short space of time to poultry is a very bad one. If you notice their habits you will perceive that the process of picking up their food under ordinary, or what we may call the natural condition, is a very slow one. Grain by grain does the meal get taken, and with the aggregate no small amount of sand, small pebbles, and the like, all of which passing into the crop assists digestion greatly. But in the "henwife's"—we by no means are personal in using this now celebrated distinctive appellation—mode of feeding poultry, a great heap is thrown down, and the birds allowed to "peg away" at such a rate that their crop is filled far too rapidly, and the process of assimilation is slow, painful, and incomplete. No wonder that so many cases of choked craw are met with under this treatment.

## ANOTHER NEW MOWING MACHINE.

The working of a mowing machine on a novel construction, as recently invented by Messrs. Burgess and Key, of Newgate-street, was exhibited on Wednesday last, on two farms at Navestock, in Essex, on each of which one of the machines was in cut upon grass. The first tried was on the farm of Mr. Daniel Hicks on a field fed with sheep in the early part of the season, previous to the rain-fall. The grass was very stout, there being at least 1½ loads per acre; but it had been a good deal trampled on, and the "old fog" of the spring growth formed a *bottom* that would have given a scythesman the back-ache, and frequently taken the edge off his tool. The machine, however, cut it, and the track-board laid it in wind-rows, leaving the intervals clear for the horses to walk in. Throughout the crop was cut as close as a bowling-green, not only on the level parts, but also in the hollows.

At Gilstead Hall, occupied by Mr. Adams, another machine of the same construction was at work on a second crop of grass, by no means heavy, and scarcely sufficiently so to stand well against the scythe. Any practitioner with that implement knows that it is liable to slip over a good deal of grass in such cases. The grass here when cut was laid into broad wind-rows, as in the other case; and the cleared ground had the appearance of a close-shaven lawn, with not a single blade uncut, or any inequalities on the surface.

Beyond cutting his own grass, Mr. Adams has cut some for his neighbours, his son working the machine, and whether cutting old meadow, or second-cut, or clover, the result in every case has been very satisfactory. He had always worked the machine with the same two horses, the average quantity cut being eight acres, and he had several times cut as much as ten acres in one day.

The peculiarities of construction in which this machine differs from those now in common use are these:—In all other mowers the crank is placed far above the level of the knife, so as to allow the cut-grass to pass under the connecting-rod. This involves an angular thrust on the knife, and great friction on the *slide* in which the knife works, resulting in great wear, and consequent liability to breakages and waste of power. It is in remedy

of this defect that the improvement is attempted. In this machine all the gearing which drives the knife is placed by the side of the wheel nearest the grass, and is so compactly arranged, that the tract cleared is sufficient for the gearing to run in. Thus, there being no grass in the way, the crank is brought into line with the knife, so as to give, through the connecting-rod, a straight thrust.

Altogether, this mower appears to have already established a good reputation in the prolonged tests to which the trial machines have been submitted. The knife-bar is, as nearly as possible, perpendicular in its position with the axle of the carriage, and consequently on a line with the lowest point of the periphery of the wheels. By this arrangement, there is no danger of the points striking into the ground, as the bar follows the inequalities of the surface with the wheels. The draught-bar is placed over the axle *nearest* to the off-wheel, by which the horse-power is applied exactly where it is most wanted on account of the resistance created by the working apparatus of the machine.

In a word, this machine has much to recommend it, whilst the manufacturers' friends speak very highly of its performances; but we must, of course, see it in competition before we can altogether endorse such a character.

**SCRATCHES AND GREASE.**—These ailments are scarcely known in well-ventilated stables, where cleanliness and care are exercised in managing horses' feet. J. B. Cheeseman sends his method of treatment, which is as follows: "Cleanse the heels with soap suds, and, when dry, apply hot tallow with a swab. One application is sufficient. Fish brine, or a coating of common white lead paint, are equally efficacious." We approve of your application of warm water and soap, and rubbing the parts dry, after which the white oxide of zinc ointment, or a little glycerine, will be found excellent applications for these diseases. They can be obtained of any good apothecary, are easily applied, and free from danger; which is not the case with the remedies you mention. —*American Agriculturist.*

## THE FORMATION OF PERMANENT MEADOW AND PASTURE LAND.

In every province of the kingdom rich meadow and grazing grounds are to be found, and natural examples of this kind are not the worst practical rules for the guidance of the agriculturist in laying down arable lands to lie permanently in grass. In many cases it may not be an easy task thus to imitate Nature, but unless her counsels are complied with profitable results cannot be expected. A "fair face" may impose upon the simple, an exterior superficiality being but too frequently exemplified in the preparation of land for permanent meadow; but the laws of nature cannot thus be overruled, for the grasses have individually their own peculiar predilections. And this, too, is not all; for if you neglect to prepare the land for the grasses intended to be grown, the land will provide plants adapted to its special economy.

The principle upon which the alternate system of husbandry is based may practically be denominated one of manurial economy. It is the first principle that has to be attended to in the preparation of land and the selection of grasses for permanent meadow and pasturage; for, if a sacrifice is made in this respect, an annual loss must inevitably be sustained afterwards. Thus, in the case of arable husbandry, experience has taught the agriculturist to grow turnips and other green crops after corn, and *rice cereal* corn after turnips and grass, so that for one application of manure he reaps a series of several different crops; but in the case of permanent grass, the different plants are grown together that are necessary to economise manurial elements so as to keep up the fertility of the land to its maximum. In many natural examples we have seen this illustrated in comparative perfection, the pasturage being as rich to-day as it was forty years ago, when we first knew it, the only other application of manure it has received during this time being the droppings of the cattle, the soil and the atmosphere supplying the plants with an abundance of food. But the vast majority of soils are deficient of certain elements, such as lime; and these have to be supplied in the form of manure. And, besides this negative defect, most soils also cannot procure from the atmosphere, including rain, dew, &c., the same amount of benefit as the exceptional few above, owing to differences of mechanical construction. They cannot even economise and use up the refuse vegetable matter which they possess; hence the reason why such accumulates in superfluous abundance of an effete character, doing harm in a two-fold manner—first by deteriorating the quality, and second by reducing the quantity of herbage annually produced.

The next thing that demands attention has reference to geological and geographical differences. The natural examples furnish an instructive lesson in both these respects, and they do so whether we examine the naturally rich soils that maintain their fertility, or the poor ones that yield only a stinted supply of coarse herbage; for between our northern and southern provinces, maritime and inland situations, and between low lying and elevated pastures, there is a wide difference in the individuality of the species of forage plants grown; and as it is in the natural example, so must it be in the artificial, both in the preparation of the land and in the selection of plants. No doubt a few of the grasses are common to every locality; but this fact has led to a very frequent error in exclusively selecting these for all permanent pastures; for in the natural examples they could not maintain their normal luxuriance without the economical co-operation of the other plants present, whose physiology is different, the latter being better adapted for one place than another, if not exclusively confined to one habitation. And even in the case of the common grasses referred to, they also differ widely in proportion and quality. Thus, the greater length of the summer day in the northern provinces affects materially their odorous and sapid properties as compared with the same species of grasses grown in the southern division of the kingdom.

Again, it will be found, on examining the natural examples, that each season has its own peculiar variety of plants in their prime as food for stock, and that these differ considerably according to the geological diversity of soil upon which they grow, including its elevation, exposure, &c. Indeed, the family of forage plants consumed by cattle may be pronounced infinite as to variety in every individual case, so prolific is Nature in supplying our live stock with the daily necessities of life. Not a few of these plants are under-estimated, at the

present time, as to their dietetic value, being considered as weeds that ought to be extirpated; and doubtless a considerable number of them are actually such, being opposed to the general welfare and economy of the dietetic class as a whole; consequently the greater this number the less perfect is the natural example, when taken as a rule, and the higher the degree of skill necessary on the part of the farmer in the performance of the work. Weeds of this kind form an interesting index to the quality of the soil, its management, climate, and elevation, and require the exercise of much judgment to understand practically the lesson which Nature thus gives to the agriculturist for his guidance. The land to be laid down to grass will, for the most part, furnish a negative example, as a rule; the vast majority of arable soils producing weeds that ought to be avoided in pastures—weeds that will cease to grow when the land is properly cultivated and manured. And it is only when land is brought into such a state that it can with any prospect of success be laid down to permanent grass.

This negative rule merits a special notice. There are a few intelligent farmers who are not practically familiar with it; for they know from experience when the land is in a condition that is likely to throw up a redundant crop of weeds, and when it promises a plentiful return of corn. It involves several cardinal conditions—first, that land should never be laid down in a bad season, to lie permanently in pasture; secondly, that the work of preparing the land must be effectually concluded prior to sowing the seeds; and, thirdly, it follows as a corollary to the last, that all book-rules must be excluded, with, perhaps, the exception of those of the most generalizing character.

From these cursory observations it will readily be seen that in laying-down land successfully to grass the agriculturist must be thoroughly master of his profession, both as to the nature of the soil and the physiology of the grasses, using the latter phrase in its widest meaning. It is equally clear that those who are thus qualified will not recommend the laying down of poor clays, because they cannot be profitably farmed under arable husbandry; for before arable land can be successfully converted into rich grazing ground, it must be in the most profitable condition for yielding corn and other cultivated crops.

**MALT.**—The quantity of malt charged with duty in England and Wales in the six months ending June 30th this year was 26,778,748 bushels, as compared with 27,308,425 bushels in 1864, and 24,597,181 bushels in 1863 (corresponding periods). The quantity of malt made free of duty for distillation and export in the half-year ending June 30th was 403,565 bushels, against 393,169 bushels in 1864, and 405,456 bushels in 1863 (corresponding periods). The quantity of malt charged with duty in Scotland to June 30th this year was 1,299,917 bushels, as compared with 1,107,548 bushels in 1864, and 1,139,189 bushels in 1863 (corresponding periods). The quantity made free of duty for distillation and export was 2,105,598 bushels, against 2,230,824 bushels in 1864, and 2,117,153 bushels in 1863 (corresponding periods). The quantity of malt charged with duty in Ireland to June 30th this year was 1,411,789 bushels against 1,487,086 bushels in 1864 and 1,238,356 bushels in 1863 (corresponding periods). The quantity of malt made free of duty for distillation and export in Ireland to June 30th this year was 432,862 bushels, against 372,161 bushels in 1864, and 312,137 bushels in 1863 (corresponding periods). Taking a general view of the whole United Kingdom, we thus find that the quantity of malt charged with duty to June 30th this year, in England, Wales, Scotland, and Ireland, was 29,485,454 bushels, against 29,803,054 bushels in 1864 and 26,974,706 bushels in 1863 (corresponding periods). The quantity made free of duty for distillation and export in England, Wales, Scotland, and Ireland was 2,942,056 bushels, against 2,996,154 bushels in 1864, and 2,834,746 bushels in 1863 (corresponding periods). The total production of malt in the United Kingdom to June 30th this year was the 32,427,510 bushels, as compared with 32,799,208 bushels in the corresponding period of 1864, and 29,809,452 bushels in the corresponding period of 1863. The quantity of malt retained for home consumption to June 30th this year was 31,275,224 bushels, against 31,867,402 bushels in the corresponding period of 1864, and 29,032,254 bushels in the corresponding

period of 1863. The quantity exported to foreign countries on drawback and free of duty was thus 1,162,211 bushels to June 30th this year, as compared with 981,806 bushels in the corresponding period of 1864, and 777,198 bushels in the corresponding period of 1863. The production and consumption of malt are accordingly shown to have slightly decreased this year.

## DISEASES OF THE EYES IN HORSES.

### INJURIES OF THE EYELIDS AND CORNEA, COLD IN THE EYE, &c.

The eyes of men are often subjected to straining, overwork, and long late hours; their diseases, therefore, are more numerous and serious than those of the lower animals.

The eyelids, especially in horses, are apt to be torn from bites, or from being caught by hooks or nails situated about the stable or on the harness. The loose portions, which are often ignorantly clipped off, should if possible be carefully preserved, brought into position, and there retained by a few pins or stitches. In the slighter cases any undue inflammation may be prevented by keeping the parts frequently wetted with cold water, or with any simple cooling lotion, such as an ounce each of sugar of lead and vinegar dissolved in a quart of water. Where adjoining parts are hot, tender, swollen, or much bruised, warm fomentations will for a day or two be preferable to the immediate application of cold. When such accidents occur in horses, it is usually advisable for a day or two to tie up the animal's head, to prevent his rubbing out the pins or stitches, or displacing the necessary applications.

The lower lid sometimes gets inverted, constituting trichiasis—a complaint greatly more common in dogs and cattle than in horses. The removing of a few of the eyelashes from the offending lid affords temporary relief; but as the hairs soon grow the evil is apt again to return, and the only radical cure is to remove with the scissors a small portion of the loose skin, and keep the cut surfaces together with one or two stitches. Tumours and warts occasionally appear about the eyelids or on the caruncle, where they interfere with the flow of tears. They must be removed much in the same manner as when occurring elsewhere. The lachrymal duct, provided for the passage of the tears from the inner corner of the eye to the nostril, occasionally becomes impervious from thickening of its lining coat, from tumours, or from fistula. By the use of a whalebone bougie, and by frequent syringing, Mr. Percival has cleared the tube for the passage of the tears.

Lining the eyelids, and reflected over the eye-ball, is a mucous membrane—the conjunctiva. During colds, sore throats, and other irritable states of the contiguous membrane lining the air passages during teething, and after exposure to cold easterly winds, the conjunctiva is apt to be irritable and suffused with an over abundance of tears. In all animals portions of chaff, hay-seeds, sand, and other foreign bodies are apt to become attached to this moist delicate membrane, causing irritation, the outpouring of tears, and closure of the lids. When the animal is secured, and the lids held open, the corner of a handkerchief will usually readily wipe away the offending body. Occasionally, however, it becomes after a time so embedded in the membrane that it cannot easily be removed without the aid of a delicate pair of forceps.

### COLD IN THE EYE, OR SIMPLE OPHTHALMIA.

From the continued irritation set up by some foreign body, from the stroke of a whiplash, or more frequently from exposure to cold, the mucous surfaces of the eye and eyelids become inflamed, constituting conjunctivitis, conjunctival or simple ophthalmia, popularly known as a cold or blight in the eye. The membrane, which is naturally smooth and glistening, now looks dry, swollen, and roughened; its vessels, which in health are minute and scarcely visible, are now scarlet, dilated, and tortuous, forming an irregular red network, of which some of the meshes are entirely filled up with extravasated blood. This reddened network and outpoured blood are perfectly superficial, and can even be moved about over the subjacent surfaces—a point which indicates the absence of the more serious deep-seated inflammation, known as specific inflammation. The eye is rather impatient of light: the tears, which in the early stages are abundant, give place to a discharge of yellow thickened mucus mixed with pus, which

sticks to the angles of the swollen lids, gincing them together. That portion of the membrane lining the eyelids is usually first and worst affected, and especially in those most frequent cases where the inflammation, beginning with common cold in the head, gradually extends itself until it reaches the adjacent conjunctiva. The treatment of this complaint is seldom difficult. The patient should be protected from inclement weather, receive a dose of purgative medicine, live for a few days on light unstimulating food, and have a stimulating lotion applied twice or thrice daily between the eyelids. For this purpose nothing answers better than a lotion containing four grains of nitrate of silver to the ounce of water.

### INJURIES OF THE CORNEA.

The instant involuntary closure of the eyelids on the approach of a blow, or such other cause of injury, protects the cornea from frequent injury. Occasionally, however, ulcers appear upon it. These are most common in dogs during or after serious and protracted cases of distemper. The general health, which in such cases is indifferent, must be promoted by generous diet, and tonic medicines, and the parts moistened daily with a solution containing five grains of nitrate of silver to the ounce of water. To cause the contraction of the iris, which in bad cases is exposed, and to abate irritation, the eye should likewise be moistened several times daily with a diluted solution of the tincture of the Calabar bean.

From the healing of ulcers from inflammation, from injury by a whip-lash, or from other such causes, specks of lymph are sometimes deposited in the structure of the cornea. Sometimes they are so slight as to be discernible only after careful examination, and are then of little moment. Sometimes they leave considerable opacity, interfere with vision, and in horses constitute unsoundness. They are perfectly distinct from cataracts, being much nearer to the surface of the eye. When recent, they are usually readily enough removed by the use of a solution of nitrate of silver, or other such stimulant.

### WORM IN THE EYE.

In India during the cold season from October to February, and especially during a wet year, worms are often found in the eyes of horses. They are white, measure from one-fourth to three-eighths of an inch in length, and are about the thickness of medium-sized sewing thread. One and sometimes two may be seen swimming about in the aqueous humour. After one worm has been removed, a second will sometimes appear within a fortnight. In a germinal state they are probably swallowed with the water drunk, thus find access to the blood, and are thence deposited in the aqueous humour. They cause considerable irritation, weeping eyes, and opacity of the cornea. Occasionally they are spontaneously absorbed; but it is unnecessary to wait for this, and when they cause annoyance they should be removed by opening the chamber with a sharp lancet about a line from the junction of the cornea with the sclerotic; the eyeball the while is pressed upon, the aqueous humour escapes, and with it the parasite. The horse for some days should be protected from strong sun light and cold rains; the humour in a few weeks is reproduced, and even the mark of the puncture disappears.—*North British Agriculturist*.

### WATERFORD FARMING SOCIETY'S ANNUAL SHOW.

On Tuesday, Sept. 12, the Waterford Farming Society held its eleventh annual show. The show of shorthorns was a capital one, as may be observed when we state that Mr. Welsted, of Ballywalter: Mr. Anderson, Grace Dieu; Mr. Jones, Mullinabro'; Sir Robert Paul, Ballyglan; Mr. Malcolmson, Milford; Mr. Bloomfield, Newpark; and Mr. Joyce, of Abbey Farm, with their crack winning animals, were the principal exhibitors. Of the prize cups, the first was the Marquis of Waterford's 50-guinea cup, to be competed for by the best two two-year-old shorthorn heifers, and open to the world; in this section the great contest lay between Mr. Welsted's Elna Rose, his Rosette, and Mr. Anderson's Game Hen 2nd, his Rosalie, and Rose of Erin. On the present occasion, the judges restored Mr. Welsted's heifer Rosette to the position she obtained at the Cork show. The next cup was that presented by the late Captain Ball, value £10, for the best shorthorned heifer calf, bred by the exhibitor, Mr. Anderson taking it with Octavia 3rd, Mr. Bloomfield coming in second for Medora, in

the gentlemen's class, there were two very superior yearling bulls exhibited, Mr. Jones taking the first place for Lord Nelson from the Westland herd, and the second to Mr. Anderson's Lord of Rocklands. In aged bulls there were but two. Mr. Malcomson's Field Marshal 2nd took the prize. In aged cows, Mr. Anderson took the lead with Dandelion. In three-year-

old heifers, Mr. Jones got first, and the cup for the best female in the yard for Lady Spencer. In yearling heifers, Mr. Anderson was first with Game Hen 2nd. The show of farmers' horned stock was good. The show of sheep was little more than an excuse for one, though there were a few good rams, and pigs were excellent.

## FROM NORFOLK TO NORTH LINCOLNSHIRE.

Now that we have had three weeks of as dry and hot weather as have occurred for a long time at this season, it would be futile to dwell on the remnant of the harvest in the counties in question as it presented itself ten days or a fortnight ago, for it has now undoubtedly been secured in fine order. But there are many points of general interest at this season, which present themselves to the eye and ear as one passes through counties, and from one county to another, and mingles with parties of men who have a direct interest in current agricultural events. In reference to the corn crops in Norfolk, it may be said the more extensively and closely they were inspected and inquired into the less favourable they appeared. Happily there are many wheat stacks and some barley stacks of the fine crops of last year in the hands of the large farmers to fall back upon; but beyond this comfort their size and condition act to make clear by contrast the poverty of the present yield. The new stacks by the side of the old ones look only half-grown, and the swarthy or muddy complexion of the new ones sufficiently indicates the inferiority of the quality. The bright thatch, in places where the straw has been well kept, makes the body of the stack look as though it were clothed in sack-cloth. The anxiety arising from this state of things, coming as it does upon past difficulties, caused many thoughtful and reasoning men to express serious misgivings in regard to the consequences to many farmers, who have expenses to meet, and to consumers of meat, who have families to sustain.

This anxiety is far from being groundless; indeed, in our opinion, it is well founded, as it but harmonizes with views which we have frequently expressed for many months past. It is the bulk of farmers who will be seriously affected by the lightness of the harvest, the badness of its quality, and, in many cases, its unmarketable condition. The men who are holders of old wheat are the exceptions, who have had the advantages of breeding-farms, and have therefore profited comparatively from the high prices of lambs and store sheep, or otherwise they have something else besides farming to trust to, or their family expenses are much beneath the average. In all businesses there are these exceptions, and it would be hard if agriculture in these respects stood alone. But after the low prices we have had, and the awkwardness of the banking accounts of middle as well as little men, how is it possible they can realize by their present crops an adequate amount of capital to enable them to fill their yards and folds with store oxen and sheep at present prices? We have repeatedly said that agriculture, like other branches of the nation's business, must settle down to a question of capital and legitimate profits on capital employed. Farmers cannot keep on borrowing or hiring capital over and over again, after, losing it piecemeal; nor after a course of oppressive and hard times can they go to wholesale houses and get credit for stock that they want for six or nine months till they can make a return of turnips, swedes, mangold, and inferior corn, which they now require to be turned into meat. With respect to the eastern counties, and similar districts, as regards importers of store stock, it is merely looking the broad question in the face to ask—what is to be done? With two-year-old oxen at £12 to £15 each, and lambs between 30s. and 50s. each, it will take from two to three acres of wheat or barley to buy one ox, and only from two to three lambs can be bought with the proceeds of an acre of either of the same staple crops. This is the way to bring the agricultural situation to its true bearing. This is the only way, too, it seems by which "farmers' friends" can be brought to judgment—by which we mean sound understanding. This, too, it also seems, is more than ever necessary; for, from all that we can now see, by what is going on around us, farmers have more cause than ever to exclaim, "Spare us from our friends!"

Viewing these matters upon these broad grounds, it is perfectly clear that the contempt in which agriculturists have been held for many years is steadily, but surely, resulting in most disastrous consequences, not only to them as a body, but to the whole community. This is not mere superficial croaking, nor is it a mere attempt to turn the tables on men who have abused British farmers and everything belonging to them, and the way they have done their business; but it is the result of looking at the signs of the times with a farmer's eye, and it is a deliberate expression of an opinion based on the information we have been able, under these advantages, to obtain. Citizens, in their simplicity as regards agricultural matters, are under the impression that farmers are making a good thing out of the present high prices of stock and meat; but it is only by the favourably situated breeding-farmers that an extra profit is being made; for farmers, who have to depend greatly on their corn for the higher rents of the good land they hold, are only able to make an ordinary return by setting the higher price of the stock they rear and fatten against the low prices of wheat and barley, while the bulk of farmers are positively worse off under the present scarcity of cattle and sheep, than they would be if animals were one-half more plentiful—reckoning the ages—and meat was one-fourth lower in price.

The "discerning British public" cannot understand the farmers, under the difficulties in which they have periodically been placed during the last twenty-five years, have necessarily sold off their cattle at times half-grown and half-fat to meet their unavoidable expenses. This, however, is so far true that three-year-old oxen grow scarcer and scarcer, till there is almost every appearance of animals of this age being novelties in fairs and markets, while two-year-old sheep are very few and far between. Nor can the "discerning British public" believe that this sudden scarcity of meat is owing to any other cause than "increased consumption from the prosperity of the country," the drought of last autumn, and the "rinderpest." The "discerning British public" say supplies do not fall off and the cattle-market returns are quoted in the daily papers to prove it; but the facts (1) that the facilities for transporting cattle by railway cause many extra cattle to be sent to London to exchange hands for eastern, northern, western, or southern consumption, according as the seasons for grass and turnips may turn, and (2) that often half and sometimes two-thirds of the foreign cattle are stores merely taken to this centre to meet the Kent, Herts, and Eastern Counties dealers—these facts are either ignorantly or wilfully withheld by journalists of a particular "bias," and the "discerning British public," who accept their conclusions, do not go to the Metropolitan Market to see for themselves; by which we allow that—and this is going a great way—a metropolitan citizen would be able to tell one from the other when he got there. So late in the last autumn store-stock season as the great Christmas market day, in the middle of December, was this the case, the stores among the foreign cattle being more numerous than the killable ones. This was because, as we have before said, the trade in foreign stores was greater last autumn than it ever was before. How, we again ask, can these facts, in the face of few roots and no hay for store cattle, be disposed of by the theorists who contend there has been no falling off in home supplies?

The only recommendation we can give to "farmers' friends" in this dilemma is to do all that can be done to make capital easy. It is the height of folly to attempt to patch up things as they now stand, by talking about the sciences, increased and improved machinery, and such like matters. Farmers want more breeding and store cattle, and that freedom of action, which will admit of their production, and, when produced, of their being held till they have grown to good size and weight.



Whether it be landlords whose rents are coming due, or bankers who can supply the "sinews of production," it is of the greatest importance that matters should be made as easy as possible—by the former by postponing rent audits as long as possible, and by the latter by being as liberal as possible in overdrawing and discounting when the same can be done with the appearances of safety. There is plenty of floating capital in the country. The nation never before so much needed that this floating capital should be as much as possible diverted into the hands of respectable and skilful, but of late years scandalized, agriculturists.

To farmers we would say, in the midst of this national dilemma, take matters—public matters—quite easy. When calm and respectful complaints have been made during the last quarter of a century, the counter-cry has been—"You farmers are always grumbling!" After you have done your business as well as you can, under the difficulties which surround you, you may rest on your oars, and allow the "discerning British public" to do the grumbling! After 25 years' persecution, it will be your turn shortly to be courted, consulted, and believed. The "discerning British public," when it has been brought to its senses by a course of facts which pertain to the pocket and

stomach, will displace their past errors and enmity, by a just appreciation of English agriculture, and offering the hand of friendship to the British farmer! What form these points are likely to take we have not space here to discuss; but with "strikes" on the plea of "high rents and dear meat," there are ample texts; for manufacturers are now as much perplexed as to the way they can compete with foreign nations, as farmers have been during the late hay and corn harvest, on account of the scarcity and high price of labour.

Passing on from Norwich, by Thetford, Brandon, and the Isle of Ely, to Peterborough, similar appearances as regards the corn crops and the abundance of feed for stock generally presented themselves. Mangolds everywhere are extraordinary. The main point of interest centred in the swede crop, about which we said something from Norfolk a fortnight since. The appearances throughout all the distance we went but confirm our views then given. Now is the time to discuss these points, that comparison may be made, and notes taken for filling in diaries for reference next sowing time.

It is gratifying to be able to say, not a single case of the cattle fever has been reported as having occurred in Lincolnshire. W. W. G.

## AGRICULTURAL STATISTICS, IRELAND, 1865.

Mr. Donnelly, the Registrar-General, has forwarded us the return of the crops grown in Ireland for the past year and the preceding, from which we make the following extracts:—  
The total acreage under all crops this year was 5,648,103 acres. The do. do. in 1864 was (revised numbers) 5,676,321 "

Showing a decrease in the total extent under crops in 1865 of 28,218 "

The crops which diminished in extent were—

		Decrease.	
		Acres.	Acres.
Cereals . .	{ Wheat . . . . .	8,410 }	79,035
	{ Oats . . . . .	70,625 }	
Green Crops	{ Turnips . . . . .	8,404 }	4,057
	{ Vetches and rape . . . . .	653 }	
Flax . . . . .			50,159

Decrease . . . . . 133,251  
The crops which increased in extent were—

		Increase.	
		Acres.	Acres.
Cereals . .	{ Barley . . . . .	4,507 }	0,585
	{ Bere and rye . . . . .	1,233 }	
	{ Beans and peas . . . . .	840 }	
	{ Potatoes . . . . .	26,170 }	
Green Crops	{ Mangol and beet . . . . .	301 }	29,478
	{ Cabbage . . . . .	1,691 }	
	{ Carrots, parsnips, and other green crops . . . . .	1,316 }	
Meadow and clover . . . . .			68,970

Increase . . . . . 105,033  
Although the foregoing statement shows a decrease of 28,218 acres in the total area under crops in 1865, there was an increase in the extent under grass to the amount of 127,470 acres, the area under "bog and waste unoccupied" having diminished by 101,543 acres.

The following abstracts exhibit the acreage under each crop in 1864 and 1865, and the increase or decrease in the latter year:

### ABSTRACT OF CEREAL CROPS.

	1864.	1865.	Increase	Decrease
	Acres.	Acres.	in 1865.	in 1865.
Wheat . . . . .	276,483	268,073	—	8,410
Oats . . . . .	1,814,886	1,744,261	—	70,625
Barley . . . . .	172,700	177,907	4,507	—
Bere and rye . . . . .	8,894	10,132	1,238	—
Beans and peas . . . . .	16,090	16,930	840	—
Total . . . . .	2,289,053	2,210,603	6,585	79,035
Decrease in cereal crops in 1865 . . . . .			72,450 acres.	

### ABSTRACT OF GREEN CROPS.

	1864.	1865.	Increase	Decrease
	Acres.	Acres.	in 1865.	in 1865.
Potatoes . . . . .	1,039,724	1,065,894	26,170	—
Turnips . . . . .	337,355	333,951	—	3,404
Mangel wurzel . . . . .	14,128	14,420	301	—
Beet root . . . . .	31,821	33,512	1,691	—
Cabbage . . . . .	28,140	24,465	1,316	—
Carrots . . . . .	20,829	20,176	—	653
Parsnips . . . . .				
Other grn. crops . . . . .				
Vetches & rape . . . . .				
Total . . . . .	1,476,006	1,501,427	29,478	4,057
Increase in green crops in 1865 . . . . .			25,421 acres.	

### GENERAL SUMMARY.

Decrease in cereal crops . . . . .	in 1865 . . . . .	72,450 }	122,609
Do. flax . . . . .	in do. . . . .	50,159 }	
Increase in green crops . . . . .	in do. . . . .	25,421 }	94,891
Do. meadow and clover in . . . . .	in do. . . . .	68,970 }	

Total decrease in the extent of land under crops in '65 28,218

He further states that the returns of live stock for 1865 compared with 1864, show an increase in the number of cattle of 231,120; of sheep, 321,801; and of pigs, 241,413; and a decrease in horses of 14,291.

The total estimated value of horses, cattle, sheep, and pigs this year was £32,772,609, being an increase of £2,043,699 compared with 1864.

It is very satisfactory to observe the continued care bestowed on the rearing of young stock throughout the country, as appears by the returns of this year, which exhibit an increase in the number of cattle, sheep, and pigs, under one year old, in each of the provinces, and almost in every county, the total increase of cattle under that age being 56,147; of sheep, 175,441; and of pigs, 220,285.

IRISH EMIGRATION.—In the first seven months of 1865 the returns of emigrants obtained at the several ports of Ireland by the enumerators show that 62,262 persons left this country, stating it to be their intention not to return. In 1864 the number for the same period was 84,586, being in this year a decrease of 22,324.

## THE LABOURERS' PRIZE LIST.

"The vigorous and flourishing society" at Kingscote held its meeting, a celebration more especially devoted to the advancement of the labourer. As will be found from the report with which we have been favoured, see page 314, there are prizes for ploughmen, for shepherds, and for good service—all very admirable incentives, whatever the Member or the Mayor of Bedford may say to the contrary. But the Kingscote Association goes rather further than this. For a local institution it is somewhat ambitious. There are periodical discussion-meetings when the moon is up; Mr. Morton is going to give a lecture on education, and a chemistry class has been established; while the mental and moral condition of country servants is to be improved in this wise: "To the agricultural labourer or female servant for the best account of the life and times of Daniel the prophet, with practical reflections thereon, £2"; with another premium, for "the agricultural labourer or female servant under eighteen years of age, for the best exposition of 'Who was Gideon, and what were the means used to impress the power of God on the minds of men through him?' with practical reflections thereon." As is well known, we have long advocated the advantages of encouraging, by the agency of public rewards, proficiency in skilled labour, respectability of conduct, and length of service. We would go even occasionally as far as they do in France, and make the merit of a good servant a matter of general congratulation. But it is quite possible to push such a system to the verge of absurdity; and if we laugh at the notion of a housemaid stipulating for her evening out to attend a singing class, or a nursemaid insisting upon her French lesson, we can scarcely do less at the idea of setting down a ploughman to pen a prize essay, or inciting a dairy-woman to prepare a theological discourse. The practical reflections upon the mission of Gideon certainly fell through, for there was no competition; but Timothy Leonard, in the service of Colonel Kingscote, gained the premium for his *Life of Daniel*—a yet more successful author, Mr. Fawkes, being disqualified, from having previously distinguished himself in this way. We seriously doubt the good that can follow from the adoption of such a course as this, which would promise the rather to turn a good workman into a mere "fiddler," who, with his head upset, would be thinking a deal more of his pen and ink than his proper vocation. In truth, the chances are that the successful essayist would soon forsake the plough-tail for the pursuits of literature; and those who know anything of a country life can imagine no more miserable lot than that of the half-educated pauper-poet or scribe, who has abandoned his proper position and vocation, mainly through the mistaken kindness of friends and patrons. And such mistaken kindness, as we take it, characterizes the proceedings of the Committee of the Kingscote Agricultural Association, when they prompt ploughmen and maids of all-work to bother their brains over theological arguments, by way of relief to their more

"practical" employment. Such items in the prize-sheet naturally enough are provocative of attack, and *The Saturday Review* pens one of its bitterest diatribes against the Kingscote philanthropists, as in this wise: "Poor Hodge of the fields! He is even worse off than his luckless brother in the towns. The artisan of the town is invited to spend his leisure hours in making a set of tea-things out of nut-shells, or in rigging little toy-boats; and he is dragged off to look at the tea-things and toy-boats which his friends have made. This is hard, certainly; but it is a great deal harder fate to be bullied by the benevolent master, and the patronizing parson, and the gushing Lady Bountiful, into writing a theological or moral essay. The dairymaid no sooner gets the butter and the cheeses out of the way, and her male companion no sooner gets the ewes and the lambs and the roots and the dung off his mind, than he and she are asked to grasp pens, and write theological disquisitions, one against the other. It is true that the man's valuable essay may bring him in a couple of pounds; while sporting with *Amaryllis* or *Nemora* in the shade might possibly cost him six pounds ten shillings per annum." Or, again: "The common notion among sensible persons is, that, after a spell of hard work, it is good to let the mind lie fallow awhile. Among the kind friends of the working-man, however, there seems to be some confusion between leaving land fallow and deluging it with liquid manure. They think that the mind is refreshed by the production or contemplation of sheer rubbish—the mind, that is to say, of the 'son of toil,' as they call a man who works for daily or weekly wages. Their own minds, it would seem, don't need the renovating process. Timothy Leonard's master would, no doubt, use very strong language if anybody pestered him to improve his mind in his leisure hours by writing an essay on the life and times of Daniel or Jerubbaal; only he would most likely not have the faintest notion who Jerubbaal was; and his ideas of Daniel even would probably be confined to something about a den of lions. Why does not somebody found prizes for 'improving the mental and moral condition' of the landed gentry, and the rich manufacturers, and the country clergy? If the Kingscote Agricultural Association would do us the honour to accept any suggestion of ours, we would respectfully submit that next year their subject might be, '*The Life and Times of Balaam, with practical reflections on the part played by Asses in the world.*'"

This is plain speaking, but the Kingscote Association has only asked for all it has got. One word more: There is no so sure a way to make a man a humbug as to encourage him to trade upon religion; and if these Gloucestershire essayists take to roadside ranting, or any other plan of shirking hard work, it is no more than their patron Society has a right to expect. The good old rule was that the best servants could neither read nor write; but there is a medium in all things, and even education need not be pushed beyond its proper use and purpose.

## CALENDAR OF AGRICULTURE.

This month generally concludes the harvest. The ricks are immediately thatched to secure the grain from damage: the covering must be in readiness for the purpose. Beans will be the latest crop: tie with straw ropes into sheaves when cut by hand-sickle, or with tarred twine, which may be preserved for many years. Beans and peas require immediate thatching, as leguminous plants imbibe and hold much moisture.

Finish the dunging of clay fallows; cart stones and tiles to drains; scour ditches; repair, widen, and straighten brooks and rivulets, and mix the excavated earths with lime for composts. Lay well-prepared composts on grass lands eaten bare, and on lucerne, the surface being first scarified, and then roll it. This preparation varies the first spring crop.

Sow winter vetches on good lands, and on partial fallows with dung—mix with beans or winter barley.

Plough the stubbles for next year's green crop fallows, and work the lands if the season be favourable; the dung may also be applied: which preparations will much further the spring operations, and are very advantageous.

Seed-furrow clay fallows, and sow wheat. Plough grass leys for the same purpose, and press and sow quickly. Scuffle pea and bean store grattans, collect and burn all weeds, and lay on dung. Sow wheat on one furrow of ploughing.

Rick hops—the flowers are put into bins, being first cut from the stems by scissors, and are paid for by fixed rate, then carried to the oast and dried, chiefly with coke: some use sulphur to give the hops a yellow tinge. The haulm of the hops is a good bitter. Place the poles in a conical erection, and cover them for next year. Keep all the live stock in good condition, and the farm horses for the autumnal operations.

## CALENDAR OF GARDENING.

## KITCHEN GARDEN.

Mushroom beds are now prepared, and produced naturally in showery weather.

Lettuce may be sown early for winter, and as soon as fit for transplantation ought to be pricked out into a roomy frame, where the plants will prosper and stand the winter. Some of the heavier sorts may perhaps endure the open air, but the frost destroys the most general kinds.

Cabbages for spring. Plant the main stock in an open situation—soil rich with manure, unless it be a new loam. All the cabbages thrive amazingly in fresh soils and earths, and much better than in old garden soils, though richly manured.

Spinach: The plants raised from seed should be thinned out to regular distances of two or three inches; the plants will then become stocky, and may be thinned again, and the plants so removed are used for the table.

Turnips: Thin out and hoe the spaces between the rows, for they should always be sown in drills. Sow salads again if required.

Routine: Exterminate every weed, and bring every plot to that state of neatness and order which renders a garden a sober quiet picture during winter, more beautiful perhaps than that of a rampant luxuriance in summer.

## FRUIT DEPARTMENT.

Plant strawberry beds and rows with well-rooted young plants, which will rarely fail—young stock provided in pots are well transplanted with entire balls. Place nets in front of any wall trees, to catch the falling fruit. If wasps abound, suspend bottles half filled with treacle water among the branches: thus thousands may be destroyed.

## FLOWER GARDEN.

Finish the clipping of box edgings; remove greenhouse plants to their winter quarters; transplant pinks raised from pipings, and also some hardy herbaceous plants. Then rough-dig or fork all the vacant parts of borders. Weed and roll gravel walks when they are in a damp state.

## AGRICULTURAL REPORTS.

## GENERAL AGRICULTURAL REPORT FOR SEPTEMBER.

The continuance of remarkably fine weather has been of immense service to the farmers in the north of England, as well as in Ireland and Scotland. Rapid progress has been made in securing the crops; so rapid, indeed, that at this time the fields are almost wholly cleared. For the time of year the temperature has been unusually high, and very little rain has fallen in any quarter. The pastures have, therefore, suffered somewhat; but, on the other hand, the root crops have derived great benefit from the remarkably fine weather. It may be observed, however, that turnips, owing to the ravages of the fly, have been a partial failure, especially in the midland and southern counties. The swedes and mangolds are by far the largest crops ever grown in this country.

Rather a large quantity of new wheat has been thrashed out and disposed of. In the quality of the samples we have noticed a great improvement compared with the previous month, and it is evident that the heavy rains in August inflicted less damage upon the crop than was at one time anticipated. We calculate the total growth as a fair average one; yet our impression is that really fine samples will command steady currencies for some time. The great falling off in the shipments of both wheat and flour from America will, no doubt, have some influence upon prices here; still, no doubt exists that we shall be in a position to meet the wants of millers, at very moderate prices. There is still a fair quantity of old wheat in stack in most of our leading districts.

The growth of barley is nearly, or quite an average; but the quality of the samples will not, we think, come up to last year. Malting parcels are therefore likely to command good prices during the whole of the malting season. Nearly the whole of last year's barleys have been consumed.

There has been a very large business doing in oats, at full prices. The imports from abroad have been extensive, but in poor condition. Both beans and peas have commanded very little attention, and the quotations have had a drooping tendency. The supplies on offer have been very moderate. The flour trade has been moderately active, and prices have been well supported. The supply of foreign on offer has been very limited. In the south of France, the crops have been all carried, and, in the northern departments, very little produce remains in the fields. In the north of Europe, harvest-work will be shortly brought to a close. The wheat crop is not quiet equal to 1864; but the growth of Spring corn is somewhat in excess of that year. American advices state that large supplies of food have been forwarded from the Western to the Southern States to prevent starvation amongst the people. Prices at the various shipping ports are, therefore, too high to admit of profitable shipment to England.

Hop-picking has gone on rapidly. The growth of hops is certainly very large, but the colour of some of the samples is complained of. The business doing has been very moderate, at from 90s. to 160s. per cwt. New hops have already arrived from Germany in good condition, and somewhat large shipments will shortly be made from the United States, where the crop is a full average.

Cotton having further advanced in price, with an excited market, the bulk of the colonial wool offered at public sale was disposed of at steady currencies. The high prices ruling for woollens in America have led to large exports of goods, and to the receipt of numerous orders from the States. There is, therefore, every prospect of a good demand for wool for several months. The stock of colonial wool now in London for the November sales is about 33,000 bales.

As to quantity the potato-crop is unquestionably the largest ever grown. We find, however, that a portion of it is turning out badly, selected quantities have therefore advanced to 110s. per ton, but really inferior kinds have changed hands as low as 25s. to 30s. per ton. Very few foreign potatoes have been reported, yet our opinion is that our markets will be amply supplied with good sound qualities during the winter.

Both hay and straw have changed hands slowly, but at good prices. Meadow hay has realized £4 5s. to £6, clover £5 to £7, and straw £1 8s. to £2 per load.

The Scotch markets have been very scantily supplied with wheat, in which very little business has been passing on rather lower terms. The new crop is certainly an average one. Barley and oats have met a slow sale at about previous rates.

In Ireland wheat has moved off slowly on rather lower terms. Barley and all other articles have realized extreme rates. The shipments of produce have been on a very moderate scale.

## REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Most of the markets held during the month have been seasonably well supplied with beasts, as to number; but their general quality has not improved. Prime breeds have consequently sold freely at enhanced quotations, but inferior stock has moved off heavily on rather lower terms.

The supplies of sheep have been tolerably good, and most breeds have shown a great deficiency in weight and quality. Downs, half-breeds, Leicesters, and Lincolns have met an active inquiry at high currencies. Inferior foreign sheep have been a mere drug; good prices have, however, been realized for them.

There has been a good consuetive inquiry for calves at enhanced quotations. The imports of foreign calves have been seasonably extensive.

Very high prices have been obtained for pigs, notwithstanding that the numbers on offer have been equal to most previous seasons.

Altogether the cattle trade has been in an excited state. The spread of disease amongst both beasts and sheep, and more especially amongst the cows in the London dairies, has created a great amount of alarm amongst the consuming classes, whilst the deficient condition in which much of the stock has been its appearance has led to long prices for superior animals. Apparently, however, the quotations have seen their highest range for the present, because it is evident that the consumption of meat is rapidly falling off, owing to the inability of the lower classes to purchase, and because the use of meat in other quarters is much restricted.

Fortunately for the country, there is an ample supply of food on hand for winter consumption. It will materially assist both graziers and flockmasters, and prevent an immense outlay of capital for cake and linseed. The disease may therefore shortly be arrested, especially as we are now nearly free from excessive heat.

The imports of foreign stock into London have been as follows:—

	Beasts	Sheep	Lambs	Calves	Pigs	HEAD.
Beasts	...	...	...	...	...	12,553
Sheep	...	...	...	...	...	67,640
Lambs	...	...	...	...	...	9,151
Calves	...	...	...	...	...	3,192
Pigs	...	...	...	...	...	9,434
Total	...	...	...	...	...	94,970

## COMPARISON OF IMPORTS.

	Beasts.	Sheep.	Lambs.	Calves.	Pigs.
1864	14,444	45,760	2,441	3,161	3,711
1863	11,923	48,021	2,759	3,213	2,895
1862	7,219	32,154	1,830	2,257	2,546
1861	6,759	34,870	1,366	2,323	3,211
1860	8,120	36,381	1,039	2,300	3,110
1859	6,968	37,733	1,358	1,744	1,830
1858	5,999	25,488	717	2,735	2,432
1857	7,346	24,090	193	1,953	2,017
1856	7,084	20,605	3,000	2,772	1,519
1855	7,101	22,744	613	1,646	2,266

The total supplies of stock exhibited in the Great Metropolitan Market have been:—

	HEAD.
Beasts ... ..	27,040
Cows ... ..	530
Sheep ... ..	151,440
Calves ... ..	3,324
Pigs ... ..	3,287

## COMPARISON OF SUPPLIES.

	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1864 .....	30,910	560	137,490	3,184	3,700
1863 .....	27,710	534	131,100	2,458	2,657
1862 .....	28,074	526	139,270	2,364	3,031
1861 .....	26,950	520	142,990	2,260	3,626
1860 .....	27,080	500	144,450	3,309	2,922
1859 .....	24,660	514	145,430	1,891	2,771
1858 .....	27,446	533	131,150	3,210	4,281
1857 .....	25,734	534	117,715	2,220	2,585
1856 .....	24,002	485	132,014	2,452	2,800
1855 .....	24,667	540	152,120	2,477	3,021

The arrivals of beasts from our own grazing districts, as well as from Ireland and Scotland, thus compare with the two previous years:—

	Sept., 1865.	1864.	1863.
From Lincolnshire, Leicestershire, & Northamptonshire ...	8,000	12,500	10,700
Other parts of England ...	2,800	4,000	2,300
Scotland ...	135	1,362	1,820
Ireland ...	1,150	161	39

Beef has sold at from 3s. 4d. to 5s. 8d., mutton 4s. 4d. to 6s. 8d., veal 4s. 4d. to 5s. 8d., pork 4s. 2d. to 5s. 8d. per 8lbs., to sink the offal.

## COMPARISON OF PRICES.

	Sept., 1859.	Sept., 1860.	Sept., 1861.
	s. d. s. d.	s. d. s. d.	s. d. s. d.
Beef from 2 8 to 4 10	2 8 to 4 10	2 8 to 4 8	2 10 to 4 8
Mutton ... 2 10 to 5 2	3 4 to 5 4	3 2 to 5 4	3 2 to 5 4
Veal ... 3 4 to 4 8	4 0 to 5 4	3 6 to 4 8	3 6 to 4 8
Pork ... 3 6 to 4 6	4 0 to 5 2	4 0 to 5 0	4 0 to 5 0
	Sept., 1862.	Sept., 1863.	Sept., 1864.
	s. d. s. d.	s. d. s. d.	s. d. s. d.
Beef from 3 0 to 4 8	3 4 to 5 0	3 4 to 5 4	3 4 to 5 4
Mutton ... 3 8 to 5 4	3 6 to 5 4	4 0 to 5 8	4 0 to 5 8
Veal ... 4 0 to 5 0	3 8 to 4 8	4 0 to 5 0	4 0 to 5 0
Pork ... 3 10 to 4 10	3 6 to 4 0	3 6 to 4 10	3 6 to 4 10

Newgate and Leadenhall markets have been very scantily supplied with all kinds of meat; nevertheless, sales have progressed slowly. Beef from 3s. 4d. to 5s., mutton 4s. 4d. to 6s., veal 4s. 8d. to 5s. 8d., pork 4s. 4d. to 6s. per 8lbs., by the carcase.

We understand that large numbers of beasts are still being supplied in Holland for our markets. Much care has been shown of late in shipping animals in good condition; still, disease has frequently made its appearance amongst the stock on arrival in this country.

## ISLE OF ELY.

Summer still lingers, and the brightest and warmest weather has been reserved for the last summer month. August was characterized by cloud and almost incessant rain, with scarcely two fine days in succession; hence our early corn crops were secured in poor condition, and fears were excited lest we should be compelled to take our corn to market during the autumn and winter months in a state unfit for immediate use, unless prepared by artificial drying; but the winds and sunshine of the last three weeks have done much to dissipate those fears, and the grain has hardened in the stack, and is now going to market in good condition. We regret our inability to report favourably of the results of the harvest throughout the fen district. Complaints are not occasional, but universal. The yield of wheat is unquestionably bad, and we cannot estimate it at less than  $1\frac{1}{2}$  qrs. per acre below an average crop, and fully  $2\frac{1}{2}$  qrs. below the yield of last year. The fen wheats appear to range between  $2\frac{1}{2}$  and  $3\frac{1}{2}$  qrs. per acre; some are even less than this, and a few, but very few, a trifle higher. And prices are not better than the crop, from 34s. to 39s. per qr. being given, leaving the return per acre between £5 and £6. This needs

no comment. The fine weather is very favourable for taking up the potato-crop, and has done something to check the ravages of the disease. Work upon the farm is generally forward, and the wheat seeding will be an early one; should we have sufficient moisture to enable us to sow when prepared. Coleseed, kohlrabi, and mangolds, are suffering from the heat, except on very cool lands. We shall not have so much winter food as was at one time expected. The cattle plague has done away with cattle markets for the present, and driven sheep up to an exorbitant price. We do not hear that the plague is spreading in this neighbourhood.—YOUR FEN REPORTER.—Sept. 19th, 1865.

## NORTH-EAST OF SCOTLAND.

Harvest is now concluded in this district, and the main facts to be recorded concerning it are, that as to weather, we have had one of the finest harvests ever known, and that the crop now in the stack-yards is greatly deficient in bulk. With respect to this latter point, we see no reason to alter the estimate given in our last report, namely, that a deficiency of at least one-third in the bulk of the crop exists in this district; and indeed, we may add that the same may be affirmed of the crop over the whole of the north of Scotland. The deficiency, though not so great in particular districts as it was in 1859, is more general, more widely extended over the north of Scotland, than it was in that disastrous year. Oats, as is pretty well known, are our staple crop, and the deficiency in this crop appears to be general throughout the island. In the small extent of wheat grown in this part of the country (in Morayshire and elsewhere) the deficiency is not so great, arising mainly from the fact that wheat is more patient of drought in May and June than oats. From the fine weather that we had for filling and ripening the grain, and from the superlatively fine weather that we have had during the brief period of harvest, there is every reason to believe that the produce of grain will be rather larger relatively to the bulk of straw, and, moreover, that the grain will be of the finest and most wholesome quality. The long continuance of dry weather, which has been so favourable for the harvest, has latterly borne hard upon the turnips. Their growth has been in a great measure prematurely arrested; the tops have faded, and rapidly assumed a sickly yellow hue; while, in the case at least of the earlier-sown fields, they are fast becoming mildewed. The favourable view taken in our last as to the produce of this important crop must therefore be considerably modified. Within the present month the potato-tops have become everywhere affected, or very commonly; indeed, quite blackened by disease, and in many cases the tubers also are said to be rapidly wasting. The dreaded cattle-plague, we regret to say, is still making progress in one of the localities into which it was unhappily introduced by London calves upwards of a month ago. The committee appointed for Aberdeenshire have been working earnestly and energetically, in order to extirpate the plague from the localities in Buchan, in which it has been more or less established for some weeks. Pastures are getting bare, and feeding-stock are now everywhere in upon the turnips. Other stock will doubtless be kept a-field as long as the weather will permit, on account of the undoubted deficiency of winter fodder.—Sept. 20.

AGRICULTURAL INTELLIGENCE,  
FAIRS, &c.

ALCESTER FAIR was the smallest known for years, and the attendance was but small. The number of sheep was 320, cows 7 only, pigs 13. Mutton fetched 8 $\frac{1}{2}$ d. to 9d., beef 7d. to 7 $\frac{1}{2}$ d. Pork trade was firm, prices somewhat higher.

BALLOCH HORSE FAIR.—The show of horses was not so good as that of last year, there being comparatively few fine animals on the ground. The demand for this class was, however, brisk, and a clearance was early effected at an advance of prices over those commanded last year. A large number of inferior stock failed to find purchasers, and were left off unsold.

BANBURY FORTNIGHTLY FAIR.—The supply of beasts was much below the average, thanks, no doubt, to the

cattle plague. Stores were nearly unsaleable, and the only trade done was in the best beasts fit for immediate slaughter. The sheep market was better supplied, and trade was brisker. Beef made about 5s. and mutton from 5s. to 6s. per 8lb. on the average. A lot of fine rams belonging to Mr. Craddock were sold by auction at an average of nearly £13.

**BARNSTAPLE FAIR.**—Much business was transacted. Bullocks, in good condition, were in fair supply, and eagerly bought up at from 12s. to 14s. per score; lean sorts were by no means difficult to dispose of at from 7s. to 8s.; steers from £12 to £20; cows and calves from £18 to £21. The supply of sheep was very large, but not out of proportion to the demand; sheep ready for the butcher fetched from 8d. to 9d. per lb.; ewes, 30s. to 42s. each. The horse fair was well stocked, especially with animals for agricultural purposes, in which there was capital choice; the bulk of those exhibited changed owners at good prices. A few first-rate hunters were disposed of.—*Times.*

**BLAIRGOWRIE FORTNIGHTLY MARKET.**—There was not a single cattle beast shown on the ground. There were a large number of sheep, which sold at extraordinary high rates. Blackfaced wethers sold at 35s. to 47s. each; blackfaced ewes sold at from 27s. to 36s. each, which would average at from 7d. to 9d. per lb. Fat pigs sold at from £3 to £6 10s. each, and young pigs sold at from 12s. to 14s. each, according to size and quality.

**BOSTON FOAL FAIR.**—The foals shown were principally of the heavy or cart breed, lighter kinds in fact being hardly represented. High rates were demanded in the early part of the day, but as buyers were anything but keen, the prices lowered considerably towards noon, and sales appeared to be numerous. The show of beasts and sheep was not large. The primeest sorts of the former made 9s. per stone. The latter, so far as stores were concerned, were a drag, and prices were from 1s. to 2s. a head below recent quotations: fat ones made 9d. per lb.

**BROADWAY FAIR** was well attended, and a good business done at the following prices:—Horn lambs and cross-breeds, 30s. to 40s.; cross-bred cows, 44s. to 50s. Fat wethers scarce, at 8½d. to 9d. Fat beef scarce, at 12s. to 13s. Barreners scarce, and met a ready sale. The display of horses was large, and of a mixed description; sale rather dull.

**BRIDGNORTH FAIR** was very well attended by farmers and dealers. The show of cattle was small; but those present were sound and in good condition, and good cows realized from 8½d. to 8½d. per lb. The show of sheep was large, and sold from 9d. to 9½d. per lb., and trade brisk. A few agricultural horses were sold at prices ranging from £19 to £20.

**CAISTOR FAIR.**—There was fully an average show, and a good trade for sheep. Lambs were well sold, and late rates easily maintained. Beasts, especially in-calvers of good quality, fetched high prices, and a clearance was effected early. Shearing rams, the property of Mr. Havercroft, were sold by auction, the best making £38.

**CARLISLE SECOND FAIR.**—The show of lambs was about 14,000, which exceeds the number exhibited at the corresponding market of last year by at least 5,000. Those consisted chiefly of half-breds, Cheviots, and crosses. The market being peculiarly one for wethers, there was almost an entire absence of ewe lambs. The most of the lots were made up of small and inferior animals, but, though this was the case, nearly as much money was paid for some of them as for the tops. There was a good steady demand for all descriptions, particularly crosses, which went off rapidly at an advance of from 2s. 9d. to 3s. 6d. on the prices current at the lamb market held in Carlisle last month. Cheviots would be up from 2s. to 3s., and half-breds from 1s. 6d. to 2s. 6d. The display of cattle was small as contrasted with last year's market. The bulk of stock on sale were Irish heifers and bullocks, in addition to a few Scotch beasts. Galloway bullocks sold at from £10 to £14; Irish two and three-year-olds at from £10 5s. to £13 15s.; heifers at from £8 to £9; and Highland storks at from £4 to £4 10s. There was a fair sale for all kinds, but there was no material change in value.

**DUNSE EWE TRYST.**—The show of ewes was scarcely so large as last year, a circumstance to be attributed to the dealers visiting the various farm-steadings and purchasing the ewes at home. Although there was a small rise on the ewes last year, the prices this year are much higher, and there is an active demand for the English markets. The demand to-day

was good for all descriptions of animals, and only those for which extravagant prices were asked were left unsold at the close of the market. The lots of ewes sold were purchased by dealers, both English and district.

**GLASTONBURY FAIR** was largely supplied with both beasts, sheep, and pigs. The attendance was also good. Trade was not very brisk, although several of the cattle changed hands at high prices. Mares and foals were in abundance, the trade for which was very dull.

**GRANTHAM FAT STOCK MARKET.**—A short supply of both beasts and sheep. Beef 8s. 6d. to 9s. per stone, mutton 8d. to 9d. per lb. A very fair trade took place.

**HOLBEACH FAIR.**—There was a large show of horses and foals, and a good deal of business was done, the prices being in advance of those obtainable of late. The top price given for a foal was £18.

**HOWDEN HORSE FAIR.**—On Monday the attendance of horse-dealers, continental commissioners, hunting gentlemen, general agents, jobmasters, farmers, &c., was as large as we ever remember to have seen. Business was chiefly confined to the inn yards, dealers being very generally employed in taking stock of the fair, inquiring after horses, matching, &c. Some of the best animals were eagerly bought up at high prices, almost as soon as they entered the town. As usual, coach-horses and hunters were most inquired after, though the trade in them was rather slow, and the prices realized lower. Good driving horses sold well. Hunters of celebrity, good stayers of power and speed, sold from 100 to 200 guineas. First-class coach-horses, suitable for broughams, 90 to 120 guineas. Many of the best of the Irish horses, young and well-bred, were selected for hunting purposes. We understand that ten Irish horses sold for 950 guineas. The ordinary animals ranged from about 30 to 50 guineas. On Tuesday morning the fair opened rather slowly. As on the previous day really good horses commanded high figures, but midding and inferior were difficult to be disposed of. Some dealers are buying for the British army. Several continental gentlemen have bought largely for consignment abroad. One of the most important features of to-day's fair was the annual sale of horses, the property of Mr. W. H. Clark, of Hook Hall, near Howden; Mr. Calthorpe, auctioneer. The amount realized for nine horses was 1,056 guineas. Amongst them, Sprig of Nobility, a bay horse, five years old, which took the first prize at the Royal Show, at Newcastle, and several other important prizes, sold for 330 guineas, to Major Stapylton. Also a chestnut horse, Cotton Stockings, four years old, which won the cup at Driffield as the best four-year-old hunter, sold to Mr. Collins, the eminent horse dealer, for 200 guineas. The remainder ranged from 33 to 110 guineas. The attendance on Wednesday morning was again very large. The horses were of an inferior character to those which exchanged hands at the commencement of the week, but there was a tolerably fair amount of business doing. First-class horses, hunters especially, maintained the high figures given for them of late years. Some prime hunters sold for from 200 to 300 guineas, though the ordinary prices for them were from 100 to 200 guineas. There was a reduction of about twenty per cent. in the prices of nearly all except first-class animals, the demand for horses not being very great this year. Neat-going active carriage horses made from 40 to 60 guineas. Sound short-jointed horses adapted for town carts, vans, and other work of that character, 20 to 25 guineas. Heavy draught horses for brewers, merchants, team work, &c., from 30 to 40 guineas. There was only a short supply of roadsters. First-class seasoned cart-horses realized from 30 to 40 guineas. Young powerful agricultural horses from 18 to 22 guineas. A lot of Shetland ponies were offered at prices ranging from five to six guineas and upwards; not many sales, however, were effected. A large portion of (principally) chestnut horses has been made during the week for the French army. Nearly all the Irish horses have changed hands, but at reduced rates from last year.

**ILSLEY FAIR.**—The supply of sheep was very small, with a dull trade, at from 1s. to 2s. a head advance on our August fair. Wethers 50s. to 59s., ewes 42s. to 54s., and lambs from 35s. to 51s.

**LEWES GREAT SHEEP FAIR.**—The number of sheep was far below the average, there being but between 16,000 and 17,000, whereas the average number exhibited for sale is about 28,000: thus there was a marked difference, distinguishable

the moment the field was entered. The number of buyers was large, and their want of lean stock, particularly sheep, being great from the abundance of feed about the country, especially on the rich soil of the western parts of Sussex, the tone of the fair was much in favour of the sellers, the demand was large, extraordinary prices were demanded and realized during the morning; as much as 6s., 8s., and 10s. per head more than last year being given for good sheep. The shortness of the supply, and the high prices which consequently prevailed, are due to a variety of causes. The utmost readiness to purchase was manifested during the morning, and pen after pen was cleared out with astonishing rapidity; but after dinner a slight reaction took place, and the owners of pens who yet held on were compelled to accept rather lower prices than those obtained an hour or so before. The prices of ewes ranged from 40s. to 52s., and for exceedingly good ones as much even as 60s. was made. Lambs fetched from 25s. to 40s. To show the contrast between Lewes fair of the present year and some fifteen years, we append the following:—

	Number.	Ewes.	Lambs.
1850	28,000	22s. to 26s.	15s. to 20s.
1855	30,000	25s. to 42s.	15s. to 25s.
1860	30,000	30s. to 40s.	14s. to 30s.
1864	24,000	30s. to 42s.	17s. to 32s.
1865	16,500	35s. to 52s.	23s. to 40s.

Mr. Humphrey, of Ashington, sold 100 ewes at 60s., to Mr. Moackon, of Kent, they were half resold at 63s., and the others at 61s. At Mr. Arkcoll's, Eastbourne, 200 lusty ewes, with their produce, 200 wether lambs in one lot made 35s. per head. The adjoining flock, Birling ewes, quite as good in quality, but being sold a month ago, of course realized less money. At Crow Link, adjoining farm, the value of lambs was 35s. At Friston Place lambs made 35s. or upwards. At West Dean 100 lambs at 42s., and 150 at 36s. At Charleston 130 ewes at 47s. Jevington ewes made, say 42s.; Montague ewes 50s.

**LINCOLN FAIR.**—There was an average show of beasts and for three-year-old steers, the price was from £20 to £24; two-year-olds £10 to £14, and yearlings £8 to £10.

**LINCOLN FAT STOCK MARKET.**—A good show of beasts and sheep; the former made 8s. 6d. to 9s. per stone, and the latter 9d. per lb.

**LOCKERBIE SEPTEMBER TRYST** was largely attended by parties interested in white stock. The number of lambs would be about 23,000, and the number of ewes 1,500. The former consisted of half-breds, Cheviots, crosses, and Highland sheep, and the latter of black-faced and Cheviots. The attendance of buyers was fully as great as heretofore, but though this was the case the market was not so quick as many had been led to anticipate. Prices for all sorts were unusually high; indeed, the like of them were never heard of before at a Lockerbie September market. The highest price going for Cheviot top wether lambs was 26s., for Cheviot mid. ewe lambs 25s., for crosses 32s., for black-faced wether lambs 16s. 6d., for ewe ditto 22s. 6d., for draft ewes (Cheviots) 34s., and for black-faced draft ewes 25s. The rise on half-breds since the August market was from 2s. to 3s., Cheviot lambs from 1s. 6d. to 2s. 6d., crosses 2s. 6d. to 4s., and black-faced lambs from 1s. 6d. to 2s.

**LOUTH FAIR.**—About 2,400 sheep were penned, but the trade was not quite so brisk as at the preceding week's market. Lambs realised from 30s. to 36s., tupping ewes 40s. to 54s. Fat Sheep were scarce and dear, viz., ewe mutton 8½d., and wether mutton 9d. per lb. A good business was done in beasts, especially in milch cows. Beef 8s. 9d. to 9s. per stone. Several lots of rams were sold, those of Mrs. and Mr. T. Young, of Belleau, averaging 28 15s. 6d. each; Mr. Young's, of Covenham, £10 12s. 6d.; Mr. Scorer's, of Burwell, £4 16s. 8d.; Mr. J. Clarke's, of Welton, £5 15s. 3d.; Mr. Chaplin's, £7 7s.

**MALDON FAIR.**—A scanty show of animals generally, and an utter absence of horned cattle. There was a sprinkling of horses—good, bad, and indifferent; but very little business was done. Sheep were better represented, but farmers have brightened up at the large prices obtained during the last fortnight, and have opened their mouths rather wider than dealers fancy for business purposes, and a very large number went back as they came.

**MONIAIVE FAIR.**—There was a brisk and good demand for stock, which consisted chiefly of lambs. The most of the lambs were soon disposed of at satisfactory prices. Mr. Muir-

head, Dumfries, bought a lot of half-breds at 33s. each, being the highest price we heard of; he also bought some clipped cross sheep at 23 each. Eunston half-bred lambs sold at 30s. each; Cheviot ewe lambs at 21s.; Cheviot wether lambs at 18s., and ewe lambs (paleys) at 16s., also a lot of crosses (shots) at 18s.

**MUIR OF ORD MARKET** was the best market for sheep that has ever been held on the stance. The prices are unprecedented, but the reasons are obvious—distrust of the quality of beef in the southern markets, and the consequent demand for mutton, which is not suspected to be tainted with disease; the scarcity of sheep for breeding purposes on the hills, and the short crop of lambs during the last three years. The stock shown was about 400 above last year. Every herd on the ground was sold off, and the demand was equal to far more stock than was offered.

**OXFORD FAIR.**—From the supply of cow cattle it might be fairly inferred that they are very scarce in the neighbourhood; but we are glad to find that such is not the case; several things militate against a large supply, independent of the prevailing disease (which has hardly been known in this locality). Farmers and graziers have an objection to send their beasts to market, and butchers very much prefer buying them at the homes of the farmer, and keep is also abundant. Beef of the best quality made 8d. per lb. Stores were quite as dear. The sheep market was largely supplied and well attended, and every head changed hands, and in most instances more than once; we were credibly informed that had there been 5,000 more penned they would all have been sold. Stores, it was remarked, made very near as much money as fat mutton; of the latter little was at market, and sold readily at from 7½d. to 10d. per lb. Figs were very scarce and very dear; bacon hogs from 11s. to 12s.; porkers, 11s. 6d. to 12s. 6d. per score.

**PARTNEY FAIRS.**—The number of sheep, although very large, was not perhaps quite equal to that of 1864, but they were generally of excellent quality, of large size, and full of wool. The business of the day commenced at early dawn, and nearly all the best animals were quickly disposed of. Lambs sold remarkably well, and at prices never before attained. Mr. Morrison, of Ashby, sold a lot descended from a sheep bought of Mr. Betts, of Holbeck-lodge, at 51s. Some pens of good drapewool ewes, for breeding purposes, made as much as 72s. A lot of 140 fine shearings, the property of Mr. Staniland, Esq., of Harrington-hall, averaged 64s. The general run of prices for lambs was from 40s. to 48s., drapes from 58s. to 64s. Shearing ewes and wethers were much inquired for, and sold at higher prices than in August; and before the fair closed every sheep was or at least might have been profitably disposed of. The beast fair was comparatively small. A dread of the terrible rinderpest no doubt caused many persons to keep their cattle at home, rather than expose them to the consequences which might be apprehended from sending them to a public fair. Those which were shown sold well. Young steers and heifers were quickly caught up, as were all animals ready for the butcher. In the prices of beef and mutton there was no reportable alteration, but there appears to be a growing opinion that the present high rates cannot much longer be maintained.

**PENRITH FORTNIGHTLY MARKET.**—There was a good display of both sheep and lambs, numbering altogether about 1,260. Generally speaking, the quality and condition of the animals were excellent; and there being a large attendance of buyers from a distance as well as for "home consumption," a keen competition set in early for the best lots, which brought a slight advance upon former rates. Only six beasts, and their condition was inferior; the three calves shown were quickly secured. Indeed, in every department of the market a good clearance was effected at an early hour, at the following average prices: Beasts 7s. 6d. to 8s. per stone, sheep and lambs 8d. to 9d., and calves 9d. per lb.

**PROBUS FAIR** was slightly supplied with bullocks. Of sheep there was an ample supply, but they sold off well, and at good prices. Fat bullocks were very scarce, and fetched from 64s. to 66s. per cwt.; lean, 47s.; cows and calves, 58s. Fat sheep, 7½d. to 8d. per lb.; store ditto about 7d.; lambs, 25s. each.

**READING FAIR.**—The supply of stock was far below the average of previous fairs here, although quite adequate to the demand, as the existing cattle plague, which has not excepted this county in its visitation, precluded speculation in store beasts, and farmers decline to stall up cattle for fattening.



purposes, until the disease is checked or presents a more favourable aspect. A limited business was transacted among store steers from £11 to £14 per head. Milking cows sold pretty freely to dairy farmers, at £17 to £22 each; and grass-fatted cattle realised £16 to £25; but many herds of stock heifers and young store beasts remained unsold. The horse fair comprised a good show of first-class animals and young horses, suitable for phaetons and private harness purposes were selected at from 35 to 45 guineas; and strong well-grown horses, for heavy draught work, 30 to 40 guineas. Handsome young and sound cart-horses, for London purposes, 45 to 50 guineas; and seasoned ditto, for farmers' work, 18 to 24 gs.; cart colts, 25 to 35 gs.; superior bred riding-horses, 50 to 65 gs.; neat cobs, 14 to 18 gs.; ponies, 6 to 10 gs.; and Welsh pony colts, 4 to 6 gs.

ST. COLUMB FAIR.—There was an excellent supply, both of fat bullocks and sheep, the former selling at from 65s. to 68s. per cwt. Fat sheep were in great demand, especially wethers, and sold at from 55s. to 60s. each, and from 7½d. to 8d. per lb. Store ewes were from 40s. to 50s. each.

TEWKESBURY FAIR.—There was a very large attendance. The supply of stock was unusually large, the number of sheep penned being greater than was ever remembered before. The auctioneers did a large business.

TOWYN FAIR.—The supply of cattle (very limited) was with ready sale at high prices. The demand was very great, and many buyers from a distance came to purchase. Yearlings fetched £6, two year olds £10 to £13 per head. Milch cows £12 to £15, steers varied according to size.

## FOREIGN AGRICULTURAL GOSSIP.

The *Journal d'Agriculture Pratique* gives a spirited engraving of Toquade, an Anglo-Limousin trotting mare. The improvement or revival of the indigenous horse breeds of France, especially of those which had acquired a reputation, is obviously one of the most important questions of which a solution can be aimed at; the problem becomes still more interesting when it concerns a race formerly celebrated and which has now almost disappeared. This is particularly the case with the Limousin breed of which M. Gavot has remarked in his *Connaissance Générale du Cheval*: "Of the old breeds of France, it is this which has deserved the first rank. Of all it was the most accredited in Europe, and it had become a national glory. There are, however, no more horses in Limousin, or at least there is no more horse-breeding in that district." After these rather dolorous words, it was satisfactory to read in a journal of the Cher that an Anglo-Limousin mare, belonging to M. Jules Frichon, proprietor at the Tertre (Indre), and ridden by its owner, had carried off the trotting prize at the five races recently inaugurated at Bourges; as the fact showed that there were still breeders who devoted themselves to the breeding of the animal which was formerly the French saddle horse *par excellence*. Toquade trotted a distance of 2,600 metres in five minutes, being at the rate of nearly 19 miles per hour. She is a daughter of Bichette, a pure Limousin, and of Bijou, an Anglo-Limousin; she is, then, three-fourths Limousin blood. She has all the characteristics of the Limousin breed, and her photograph engraved by the *Journal d'Agriculture Pratique* is certainly that of a very pleasing animal.—An international agricultural exhibition held recently at Cologne marks an epoch in German agriculture, because it had the stamp of universality, which was lacking in all its predecessors. It was not like the shows held during the last year or two at Hamburg and Stettin, an exhibition of the products of the north of Europe, but among its immense muster-roll of exhibitors were a great number of English, Italians, Spaniards, Russians, Algerians, Americans, &c. The exhibition was due to the initiative of a comparatively private society named the Flora, and it was organized, or perhaps as we ought rather to say improvised in a month. The original site was confined to the botanical garden of this society, but it was obliged to be extended by the adjunction of adjacent lands, so that it occupied at least a surface of about 24 acres. In this area might be seen 12,450 implements, machines, &c., and 6,500 lots of agricultural products. If we consider that all the district shows combined in France only presented in 1865, 4,052 engines and implements, and 1,739 lots of products, it will be easy to form an idea of the importance of the Cologne exhibition. Add to this statement the fact that these products were laid out in a well-designed garden, under elegant shelter, and you will have, reader, a tableau all the more splendid since it had for accessories the city of Cologne with its fine buildings, and the Rhine, and one of the districts most advanced in agriculture for its base. The exhibition was opened June 2, and closed July 2. It was confined to the inanimate agents of agriculture, which were divided into the six following categories: First, agricultural engines and implements; secondly, household and domestic utensils; thirdly, garden architecture; fourthly, sylvercole products; fifthly, the raw

and manufactured products of agriculture; sixthly, geological and mineralogical products. This extensive programme enabled agriculture to extend a large hospitality to products which would have been more in their place in an industrial or artistic exhibition. The great majority of the machines and implements known and recommended in the agricultural world figured at the show, but as in all late exhibitions steam-engines were the most sought after, because in the present circumstances of production the cultivator and the economist anticipate from them an improvement in the present position of agriculture. Of the three steam-ploughs which should have taken part in the exhibition only one presented itself, viz., Fowler's with its successive improvements. Messrs. Garrett and Messrs. Howard declined to compete in consequence of the want of success which they experienced at Stettin, and which they do not consider that they deserved. Fowler's plough worked in the presence of the Prince of Prussia and excited astonishment by the energy with which its four shares attacked the soil. Three traction-engines—or as the French call them, *autohebillas*—worked during the whole period of the show, and acquitted themselves, empty or loaded, to the satisfaction of the spectators. One of these engines exhibited by Schwarzhop, of Berlin, occasioned a fire, which, thanks to the steam fire engines exhibited at the show, was easily suppressed. The steam fire engines, we may add, contended tenaciously for the prize, and after numerous experiments, it was awarded to the apparatus of Messrs. Merryweather and Sons, of London. More than 50 thrashing machines were put in motion by steam; they belonged, for the most part, to the best English Houses, such as Messrs. Ransomes and Sims, Messrs. Clayton and Shuttleworth, &c. The German makers, nevertheless, sustained an active competition against them; the house of Pintos especially distinguished itself under this head. Among the great number of portable engines intended to be used as motors for agricultural purposes that of MM. Tilkin, Mention, & Co., of Longdor-lez-Liege, was a good deal remarked. A centrifugal pump, of which several inventors disputed the idea, and which was also shown by MM. Tilkin, Mention, & Co., likewise attracted some notice. The merit of the idea was disputed by several inventors; Denis Papin, when he was professor at the University of Marburg, published a description of a centrifugal pump, and it is after this description that MM. Tilkin must have constructed their apparatus. A Lenoir motor, exhibited by Mévius, of Hamburg, was of three-horse-power, and was from the workshops of MM. Gautier and Co. of Paris. As regards other motive forces, nothing new was remarked. Transmissions of movement for long distances by the aid of metallic cables were principally applied by Guillaume and Felton, of Cologne. It appears that this system is likely to exert an important influence in the future, judging from its rapid propagation. More than a dozen reaping and mowing machines took part in experiments which came off June 3, in a field of rye still green. The majority of the novelties figured badly in the affair, and were obliged to retire from the competition. The machine of Samuelson, of Banbury, overcame all difficulties, although they were by no means of an ordinary character. A Cologne maker, named *Erpelding*,

had also a good success. This industrial has, for some time past, constructed reapers on plans which he had received from America, and which he has since modified. If from machines we passed to implements, we found at the Cologne-show a collection of the ploughs of Dr. Race, an old professor at Hohenheim. This collection (which comprised no less than 174 models executed with the greatest exactitude) was a striking illustration of the progress of cultivation and of its history; it showed how the mere curved branch underwent a gradual series of transformations until it became the improved plough of our own times. Of the other ploughs exhibited, those of Eckert (of Berlin), Hohenheim, and Bertz carried off the most successes. The steam cooking apparatus of Basse, of Kassel, the apparatus of the Household Society of Paris, and the straw-cutter of Eberhardt, of Ulm, presented some points of novelty; and the rich collections of gardening-tools exhibited by Beyersmann, of Weringhausen, and Asbeck, of Hagen, were also noticeable for their beauty and cheapness: in the latter respect they defied all competition. A collection of the agricultural and forest products of Algeria deserves to be placed at the head of all the *assortiments* exhibited in the section of agricultural and forest products. We may mention the textile products, cottons, &c., the wheat, bran, and tobacco of this colony as worthy of notice. This section comprised also wool from Buenos Ayres, chicory from Belgium, ale and wool from England, and flax and hemp from Russia. Tobacco was most powerfully represented by exhibitors from America, Baden, Prussia, Hanover, Bremen, and Russia. There was also a good collection of spirits, wines, beers, and liqueurs. Commercial manures were annexed to the section of agricultural

products, and profited largely from the arrangement. The fossil phosphates of M. de Molon obtained a special distinction. The forest exhibition was very complete. Besides wood of every kind, there was a complete collection of sleepers exhibited by eighteen of the principal administrations of continental railways. These specimens enabled a conclusion to be drawn as to all modes of preservation, the sleepers having been withdrawn from the ground after a long period of interment. The palm remained with the creosoting and sulphatizing processes. The forest administration of Hanover sent a rich and varied collection, and a collection of the maritime signals employed in Prussia was also on view. The object of the latter was to make known to forest proprietors the woods required by the Admiralty.—An agricultural show of some interest has just been held in the French department of the Creuse; or, to be more precise, at the town of St. Sulpice-les-Champs. The bovine race was largely represented. There were 70 or 80 bulls, of one year to thirty months old; 30 heifers of the same age, and a few more cows which had exceeded that age. The prevailing race was that of the district: there were also some animals of the Limousine, Salers, Parthenaise, and Charolaise breeds. The exhibition of cattle left, however, a good deal to be desired, notwithstanding the presence of a great number of really remarkable subjects. The prizes devoted to these beasts amounted to £126, of which only £32 was devoted to heifers and calves. The exhibition of sheep was superior to that of cattle. There were some excellent rams on view, and several lots of ewes and lambs, which seemed to be well-selected. The amount of the premiums awarded to sheep was £30. Pigs were somewhat feebly represented.

## REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The year, as far as it has advanced, has been of an extraordinary character. With a deluge of rain in August, we have had a renewal of summer in September, with tropical heat; and the rain has been limited to a few thunder-showers, and one heavy fall on the night of the 20th, which did much good. Those, therefore, who were late with harvest work had what may be called "extraordinary luck;" and our northern friends this season will have fared far better than their southern brethren, while the power of the sun has been such as partly to penetrate the stacks out of order, as well as benefit the corn spread out to dry. But, though the cold and late farms will this season be best off, we cannot boast, as a whole, of samples; and much must pass through the frosts of winter before it will find a ready sale to millers. The quality, moreover, does not come up to the average of late years; and though there are fine heavy samples to be procured, the best will not compare with 1864 or 1863. If we reach an average, under these circumstances, we shall be surprised. But an average growth, we have long found out, is not enough for the annual consumption of the country; and though we cannot speak very favourably of the British Isles, it seems more certain that Europe is seriously under the mark. France is partially deficient, Germany still more so, and Poland suffered fearfully in August, while part of Southern Russia notes a failure. Beyond this state of things, American advices from the West prove bad, and accounts from New York bid us not to expect what we have been recently receiv-

ing. Added to this intelligence, reports of the late potatoes come worse and worse; and, with the cattle plague fastened on the country, prospects are more discouraging than for some years as to the supply of human food. Yet such was the influence of the change of weather from the rains of August, that for the first fortnight of the past month markets came tumbling down, as though it were a year of plenty, new wheat being cheaper 3s. to 4s., and old 1s. to 2s., till a little reaction at last appeared, and people seemed coming to themselves. We thought the lowest point was reached on the 18th, and said so; and we now think before next harvest a rise of fully 10s. per qr. is very probable. The following rates were recently current at the places named: The best wheat at Paris was quoted 43s. per qr., at Antwerp fine native red was 47s. 6d., at Louvain 46s., at Maestricht the top price was 45s. per qr. In Hamburg, Marks wheat was quoted 45s. 6d.; and some speculation had commenced, from the badness of the crops in the surrounding districts. At Danzig the best wheat of 1864 was worth 47s. 6d. per qr. free on board; and fine old, cost and freight included, was held at 58s. per qr. At Cologne the price of red was 41s., at Straubing 33s. Marianopoli wheat, afloat, has been sold at 41s., Ghirka at 40s. At Montreal spring wheat was worth 37s. 8d. per qr. of 480lb. New York prices were very high—Chicago and Milwaukee 38s. to 39s. 6d. per 480lb. the best amber, 49s. per 480lb. white.

The first Monday in March-lane began on a moderate supply of English wheat, with fair arrivals

of foreign. There was only about an average show of samples during the morning from Kent and Essex, mostly new, and some of it in such sorry plight as to be quite passed by, or sold at very irregular rates. Even the best qualities were down 2s. per qr., while old scarcely supported the previous rates. The foreign trade was excessively dull; and where sales ex ship were forced, holders had to consent to some reduction. With few arrivals off the coast, there was but little abatement on cargoes. With the return of summer weather at its height, farmers who were late were intent upon securing the benefit; but many sent their badly-secured produce to market, and were generally obliged to accept a reduction of 2s. to 3s. per qr. on new samples, with an occasional decline on old, the value of which was affected by the quantity sent to market. At Edinburgh wheat was down 1s. 6d. per qr., and at Glasgow the decline on all sorts was 1s. per qr. Dublin was thoroughly dull, with so little doing that prices could only be considered nominal.

On the second Monday there was less English and more foreign wheat in the returns. There was a rather larger show of samples this morning from Kent and Essex, with several parcels in better condition, as a consequence of the improved weather; but there was still a large proportion of poor quality. This was another dull and falling market, with very little done, though a decline of 1s. to 2s. would have been gladly accepted to make way; while old was also down 1s. per qr. The foreign trade was perfectly lifeless; and to do business only in retail, it was necessary to yield 1s. per qr. It was well, at such a time, that but few floating cargoes were reported; for even these could only be sold on somewhat easier terms. The weather continuing unprecedentedly fine and hot, nothing could be more opportune for the later gatherings; but, as a consequence, there was no diminution of the previous heaviness, and a decline to the same extent, in the country, on new samples was the order of the day—say 1s. per qr. on old, as reported at London, and 1s. to 3s. on new, according to quality, the lowest being the most difficult to clear. Wheat at Glasgow was also down another shilling per qr.; but at Edinburgh there was little difference, though trade was dull. Native wheat, not being in large supply at Dublin, did not seriously decline; but foreign was down 6d. to 1s. per barrel.

The third Monday's returns showed an increased quantity of home-grown wheat, with liberal foreign arrivals. The show of samples on the Kentish and Essex stands this morning was materially reduced, and the condition as much improved, farmers appearing disinclined to continue a course of sacrifice with their new crop. Rather more disposition to do business was evinced on the part of millers; but it was found impracticable to raise prices, though a tolerable clearance was eventually made of the little offering for sale. A retail trade was experienced for all good dry granary samples, at about previous rates; but to have sold any quantity from ship would have required some reduction. With but few cargoes afloat offering, and holders pretty firm, there was no change in prices. The

weather this week kept fine up to Wednesday night, allowing the bulk of the late harvest throughout Great Britain to be secured in good order. Farmers were not, however, further disposed to lower prices, in order to sell, and many markets evinced an upward tendency for all good qualities, both new and old. Indeed, at some places—as Boston, Lincoln, York, Wakefield, and elsewhere—1s. per qr. advance was noted. Birmingham was full-priced, and Liverpool on the last market rather dearer. Edinburgh noted no change this week; but at Glasgow new Wheat was 1s. per qr. lower. Dublin was down 6d. per barrel, with very little trade.

On the fourth Monday the arrival of English wheat was moderate; but the foreign supply more abundant than during any previous week, nearly half being from Danzig, and one-fourth from Russia. The morning's show of samples was small, the condition being further improved, but most of the quality still inferior. Many country markets having somewhat improved, factors were generally enabled to secure 1s. advance on new samples, which had previously been unduly depressed; but old, having been held at full prices, did not participate in the improvement. The foreign trade was mostly on a retail scale; but here and there favorite qualities obtained rather better prices, and, though the trade was far from active, holders were generally firm.

The imports into London for four weeks were 22,182 qrs. English and 103,990 qrs. foreign, against 26,954 qrs. English and 81,954 qrs. foreign for the same period in 1864. The London averages commenced at 47s. 6d., and closed at 42s. 2d. per qr., while the general average began at 45s. 4d., and ended at 44s. 7d.—the lower rates for London being attributable to the quantity of inferior new wheat sent up. The imports into the Kingdom for the four weeks ending Sept. 16, were 1,926,691 cwt. wheat, and 235,280 cwt. flour. The London imports for four weeks were 780 qrs. wheat, and 1,287 cwt. flour.

The flour trade during the month has been remarkably steady as compared with wheat, prices throughout not having undergone any material change. This may partly be attributed to the very scanty foreign arrivals and lowness of the stocks of American, which almost placed the trade into the hands of town factors. Norfolks have ruled at 33s. per qr. for the best, and barrels have been at retail prices, while the town trade has been steady, the top price remaining 43s. all through. The imports into London for the four weeks were 70,103 sacks English, and 1,085 sacks 9,668 hris. foreign, against 53,723 sacks English, and 1,267 sacks 77,972 barrels foreign for the same period in 1864. At the recent rates ruling at New York and Montreal there is very little prospect of liberal imports this side Christmas.

Business in malting barley can hardly be said to have yet commenced, supplies hitherto being very insignificant, and the weather quite against trade, from its extreme heat. The few very fine bright-coloured samples that have hitherto appeared have gone off freely at full prices; but those discoloured by the rains of August attracted very little atten-

tion, and were difficult to quit. Heavy foreign, though at the beginning of the month it found favour from the want of settlement in the weather, became neglected, as it settled into fine, and even granary sorts have met with less inquiry, though prices have been low—say 22s. to 23s. per qr. for Danube qualities. As much of the English crop is likely to prove inferior, the trade may be heavy till cold weather sets in. The imports into London for the four weeks were 4,365 qrs. British, and 20 131 qrs. foreign, against 5,531 qrs. British, and 24,976 qrs. foreign for Sept. last year.

Malt, which at the beginning of the month was tending upwards, has lost the improvement during the fine weather.

The supplies of foreign oats during the month being less than half what they were in August, it might have been expected that prices would have improved; but the fine weather was against it, as well as the fact that large dealers had well stocked themselves during the glut, and could very well hold off till arrivals again became liberal. This they did on the fourth week, and had it not been for the increased demand, lower rates might have ensued. But the belief in the shortness of the English crop, and diminution of stocks on the part of dealers, kept rates at about their previous range, excepting a slight reduction on Russian, and we do not see much prospect of decline before Christmas. The imports into London for four weeks were 8,360 qrs. English, 396 qrs. Scotch, 3,086 qrs. Irish, and 134,946 qrs. foreign, against 7,322 qrs. English, 6,497 qrs. Scotch, 14,048 qrs. Irish, and 191,811 qrs. foreign in Sept. 1864.

Beans have not varied in value through the month, but have gradually been tending upwards, notwithstanding the high rates at which they began. Samples of the new crop cannot come in quantity yet awhile, and will not be liked for consumption. So old foreign as well as English are likely to become very scarce and dear as the cold season advances, and nothing could check a further advance but the low rates of barley, oats, and maize. The imports into London for four weeks were 773 qrs. English, and 2,261 qrs. foreign, against 2,355 qrs. English, and 5,280 qrs. foreign last year. So that the imports this month are less than one-half.

The demand for peas has been very moderate during the month, so that the smallness of the supplies have not caused any advance on hog feed, though boilers of fine quality have rather improved in value. The stocks of old foreign white, used as a substitute for beans for the feeding of horses, has become very much reduced, and being cheaper than that grain, will soon be used up, and very probably turn the attention of consumers to Indian corn. The imports into London for the four weeks were 1,405 qrs. English, and 1,251 qrs. foreign, against 1,460 qrs. English, and 5,605 qrs. foreign in Sept. 1864.

There has been a considerable diminution in the imports of linseed, and with oil much dearer it has risen 1s. per qr., though cakes have not altered in value, their demand being lessened by the rapid growth of grass and esculents after the August rains. The seed trade, which was becoming excited in August, has sunk into quiet.

New cloverseed has been offering from France at moderate rates, though the crop there is sure not to be large. In America it is reported as abundant, but prices have not yet settled for business. Mustardseed has been dull, and cheaper for inferior qualities. Canaryseed has risen 2s. or 3s. per qr.; but winter tares, abundantly offered and of poor quality, have fallen to 5s. and 5s. 6d. per bushel.

#### CURRENT PRICES OF BRITISH GRAIN AND FLOUR IN MARK LANE.

		Shillings per Quarter.	
WHEAT, Essex and Kent, white	new 35 to 43	44	53
	red	34	43
Norfolk, Lincoln, and Yorkshire, red		43	46
BARLEY	27 to 30	Chevalier, new	30 37
Grinding	28 29	Distilling	28 32
MALT, Essex, Norfolk, and Suffolk			68 66
Kingston, Ware, and town-made			68 66
Brown			60 64
RYE			26 28
OATS, English, feed 19 to 23	Potato	22 27	
Scotch, feed 18 23	Potato	22 27	
Irish, feed, white 17 20	Fine	21 24	
Ditto, black 17 20	Potato	21 24	
BEANS, Masagan	36 39	Ticks	36 39
Harrow	39 41	Pigeon	41 46
PEAS, white, boilers	37 41	Maple 37 to 40 Grey, new	35 37
FLOUR, per sack of 280 lbs.	Town, Households	38 43	
Country, on shore 31 to 34		35 36	
Norfolk and Suffolk, on shore		31 33	

#### FOREIGN GRAIN.

		Shillings per Quarter.	
WHEAT, Dantsio, mixed	47 to 51	old, extra	51 to 57
Königsberg	45 49	extra	49 51
Rostock	45 49	fine	50 51
Silesian, red	43 45	white	48 48
Pomera, Meckberg, and Uckermark		red old	43 49
Russian, hard, 38 to 39	St. Petersburg and Riga	42 44	
Danish and Holstein, red		41 43	
French, none	Rhine and Belgium	44 49	
American, red winter 44 to 47	spring 43 to 46	white	47 50
BARLEY, grinding 22 to 25	distilling and malting	27 32	
OATS, Dutch, brewing and Poland 18 to 23	feed 17 21		
Danish and Swedish, feed 19 to 22	Stralsund	19 23	
Russian, Riga 19 to 22	Arch. 18 to 21	Paburg	20 24
BEANS, Friesland and Holstein		35 38	
Königsberg	35 to 39	Egyptian	37 38
PEAS, feeding and maple	36 39	fine boilers	39 41
INDIAN CORN, white	30 35	yellow	30 34
TARES, p. bush, winter 5s. 5s. 6d.	Lentils	—	
FLOUR, per sack, French	32 35	Spanish, p. sack	33 35
American, per bbl.	22 24	extra and d'ble	25 27

#### IMPERIAL AVERAGES

For the week ended September 16, 1865.

Wheat	62,441½ qrs.	44s. 7d.
Barley	6,179 „	30s. 10d.
Oats	5,329½ „	20s. 11d.

#### AVERAGES

FOR THE LAST SIX WEEKS:		Wheat.	Barley.	Oats.
	s. d.	s. d.	s. d.	s. d.
August 12, 1865	42 0	27 10	23 6	
August 19, 1865	43 1	27 11	23 10	
August 26, 1865	45 4	30 0	24 3	
Sept. 2, 1865	46 7	31 2	23 7	
Sept. 9, 1865	46 0	31 2	23 1	
Sept. 16, 1865	44 7	30 10	20 11	
Aggregate Average	44 7	29 9	23 3	
Averages last year	42 4	32 1	21 9	

#### COMPARATIVE AVERAGES.

WHEAT.		BARLEY.		OATS.	
Years.	Qrs. s. d.	Qrs. s. d.	Qrs. s. d.	Qrs. s. d.	Qrs. s. d.
1861	80,147½ 54 6	9,293½ 36 4	9,174½ 22 11		
1862	59,969½ 55 10	2,326½ 36 7	7,276½ 24 7		
1863	78,909½ 44 1	9,287½ 32 7	6,355½ 21 8		
1864	65,643 42 4	5,316½ 31 1	5,475½ 21 9		
1865	62,441½ 44 7	6,179 30 10	5,329½ 20 11		

#### LONDON AVERAGES.

Wheat	4,984 qrs.	42s. 2d.
Barley	344 „	32s. 9d.
Oats	285 „	20s. 1d.

## FLUCTUATIONS in the AVERAGE PRICE of WHEAT.

PRICE.	Aug. 12.	Aug. 19.	Aug. 26.	Sept. 2.	Sept. 9.	Sept. 16.
42s. 0d.	...	...	...	...	...	...
43s. 1d.	...	...	...	...	...	...
44s. 7d.	...	...	...	...	...	...
45s. 4d.	...	...	...	...	...	...
46s. 0d.	...	...	...	...	...	...
46s. 7d.	...	...	...	...	...	...

## PRICES OF SEEDS.

LONDON, MONDAY, Sept. 25.—The trade in Cloverseed continues inactive, and the moderate values required for new French do not induce buyers to commence operations. White seed and Trefoils are without alteration. Winter Tares were without alteration from last week's values. Canaryseed fully maintains its value, with improved sales. CUTLER AND BARKER, Seed-factors.

## BRITISH SEEDS.

MUSTARD, per bush., white	10s. to 12s.
CANARY, per qr.	50s. 56s.
TARES, winter, new, per bushel	5s. 0d. 5s. 0d.
CLOVERSEED, red	—s. —s.
CORANDER, per cwt.	27s. 28s.
TREFOIL	54s. 58s.
LINSEED, per qr., sowing 56s. to 62s., crushing	72s. 76s.
RAPESEED, per qr.	£9 10s. to £10 10s.
LINSEED CAKES, per ton	£5 10s. to £6 0s.
RAPE CAKE, per ton	£5 10s. to £6 0s.

## FOREIGN SEEDS.

CORANDER, per cwt.	20s. to 22s.
CANARAWAY	—s. 33s.
TREFOIL	25s. 26s.
HEMPSEED, small —s. per qr., Dutch	—s. 48s.
CLOVERSEED, red —s. to —s., white	—s. —s.
LINSEED, per qr., Baltic 58s. to 60s. Bombay	68s. —s.
LINSEED CAKES, per ton	£9 10s. to £11 0s.
RAPESEED, Dutch	—s. —s.
RAPE CAKE, per ton	£5 0s. to £6 0s.

## HOP MARKET.

BOROUGH, MONDAY, Sept. 25.—There is a good demand at present in our market for all Hops of the new growth, attention being directed chiefly to samples of best quality. Prices of colour Hops continue firm, and at Worcester Fair and elsewhere large parcels have changed hands during the past week.

Mid and East Kents...	115s., 140s., 160s.
Farnhams & Country.	115s., 120s., 160s.
Weald of Kent	100s., 110s., 124s.
Sussex	95s., 105s., 112s.
Yearlings...	95s., 120s., 140s.

## POTATO MARKETS.

## BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, Sept. 25.—The supply of Potatoes on sale tolerably large. Good and fine qualities are in steady demand, at from 80s. to 110s.; otherwise the trade is dull, and prices rule as low as 40s. per ton. About 70 tons came to hand from Continental parts last week.

COUNTRY POTATO MARKETS.—DONCASTER, (Saturday last): A plentiful supply, which met with a good demand at the following prices—wholesale 6s. to 7s. per load, retail 8d. to 10d. per peck. MANCHESTER, (Saturday last): Potatoes 5s. to 9s. 6d. per 252lbs.

## PRICES OF BUTTER, CHEESE, HAMS, &amp;c.

BUTTER, p. cwt.	s.	s.	CHEESE, per cwt.	s.	s.
Friesland	120	126	Cheshire	64	76
Jersey	96	116	Dble. Gloucester	66	70
Dorset	124	129	Cheddar	66	70
Carlow	—	—	American	56	62
Waterford	—	—	HAMS: York	94	112
Cork	—	—	Cumberland	94	116
Limerick	—	—	Irish	90	100
Sligo	—	—	BACON	—	—
FRESH, per doz., 12s. 0d. to 16s. 0d.	—	—	Wiltshire	62	89
	—	—	Irish, green	74	82

## ENGLISH BUTTER MARKET.

LONDON, MONDAY, Sept. 25.—Since our last Butter has become dearer, and prices current now are—

Dorset, fine	128s. to 130s. per cwt.
Devon	120s. to 124s. per cwt.
Fresh	13s. to 16s. per dozen lbs.

CORK BUTTER EXCHANGE, (Saturday last).—In the beginning of the week the supplies were light, and prices were well sustained; but on yesterday and to-day the quantity of butter in market was very large, being over 2,000 yesterday, and about 2,800 to-day; and the demand was consequently less. Since Monday, firsts rose from 120s. to 122s., seconds from 116s. to 117s., thirds from 108s. to 111s., and fourths from 98s. to 100s.; but fifths fell from 85s. to 93s. The supply of mild cured is small but steady. Its price to-day is 126s., 122s., and 116s.

GLASGOW, (Wednesday last).—Supplies of cheese come forward freely, and, though buyers are rather cool, prices are well maintained. About 30 tons passed the weigh-house scale—Dunlop, old 63s. to 68s., new 59s. to 62s.; Cheddar-mak, new 62s. to 66s.; skim-milk, 24s. to 26s. per cwt.

READING CHEESE FAIR.—In cheese an advanced value is obtained; singles make 56s. to 60s., and doubles 70s. to 80s. per cwt.

## WOOL MARKETS.

## ENGLISH WOOL MARKET.

CITY, MONDAY, Sept. 25.—There has been a fair demand for home-grown Wool for export purposes since our last report, at full quotations. For home use, however, next to nothing has been doing. The quantity of Wool on offer continues limited: the prospect is, therefore, that prices will continue steady.

## CURRENT PRICES OF ENGLISH WOOL.

FLEECES—Southdown hoggets	per lb.	s.	d.	s.	d.
Half-bred ditto	—	2	0	2	1
Kent fleeces	—	2	0	2	4
Southdown ewes and wethers	—	1	8	1	9
Leicester ditto	—	1	10	2	4
Sorts—Clothing	—	1	6	1	11
Combing	—	1	7	2	6

LEEDS (ENGLISH AND FOREIGN) WOOL MARKETS.—The demand for English wool is good, but there is no disposition to speculate. The consumption keeps up, and the trade seems healthy for most kinds of wool. In clothing wool there is a fair business doing and prices are steady, but for good sound stapled wool rather higher prices can be got.

## LIVERPOOL WOOL MARKET.—Sept. 23.

SCOTCH.—The demand continues on the same limited scale as reported last week. Stocks of all kinds are unusually light for this period of the year.

	s.	d.	s.	d.
Laid Highland Wool per 44lbs.	18	0	20	0
White Highland do.	23	0	26	0
Laid Cheviot do. unwashed	28	0	30	0
Do. washed	24	0	28	0
White Cheviot do. washed	40	0	48	0

FOREIGN.—There has been a fair business done during the week at full late current rates.

## MANURES.

## PRICE CURRENT OF GUANO, &amp;c.

Peruvian Guano, direct from the importers' stores, or ex ship (30 tons)	£12 5s. to £13 10s. per ton.
Bones, 28 lbs. per ton	Animal Charcoal (270 per cent. Phosphate) 25 per ton.
Coprolite, Cambridge, whole £3 5s. to £3 8s., ground £3 15s. to £3 18s.	Suffolk, whole £1 18s. to £2, ground £2 10s. to £2 12s. per ton.
Muriate of Potash, £13 to £14 per ton.	Nitrate of Soda, £15 to £16 per ton.
Sulphate of Ammonia, £14 to £15 per ton.	Gypsum, 30s. per ton. Superphosphate of Lime, 25s. to £6 5s. per ton.
Sulphuric Acid, concentrated 1'46 1d. per lb., brown 1'12 3/4d.	Blood Manure, 26 5s. to 27 10s. per ton. Dissolved Bones, 26 15s. p. s.
Linseed Cake, best American barrel, £11 5s., ditto bag £10 10s. p. s.	English, £11 to £11 10s. Rape Cake, 25 15s. to 26 per ton.

E. PURSER, London Manure Company,  
116, Fenchurch Street, E.C.

Guano, Peruvian £12 7 6 to £20 0 0	Linseed Cake, per ton—
Do. Upper do. 5 15 0 to 6 0 0	Americ. thin, bgs. £9 0 0 to £2 5 0
Korla Moorla 0 0 0 to 0 0 0	Do. in bris. 0 0 0 to 0 0 0
Bone Ash 0 0 0 to 0 0 0	English 9 10 0 to 10 0 0
Brimstone, 2d 3rd 0 0 0 to 0 0 0	Cott. Cake, decort. 0 0 0 to 0 0 0
Saltpetre, Bengal, 2 per cent. 0 0 0 to 0 0 0	Ind. Bomb. p. qr. 3 13 0 to 3 15 0
Nitr. of Soda, p. ct. 0 12 6 to 0 15 0	Rapeseed, Guzerat 3 13 0 to 3 15 0
Cloverseed, Amer. 2 5 0 to 2 6 0	Niger 2 5 0 to 2 6 0
red, new per cwt. 0 0 0 to 0 0 0	super. Norths 2 7 0 to 2 8 0

SAMUEL DOWNES and CO., General Brokers,  
Exchange Court, Liverpool.

Prentice's Cereal Manure for Corn Crops	per ton £10 0
Mangold Manure	6 0 0
Prentice's Turnip Manure	6 10 0
Prentice's Superphosphate of Lime	6 0 0

Printed by Rogerson and Tuxford, 246, Strand, London, W.C.

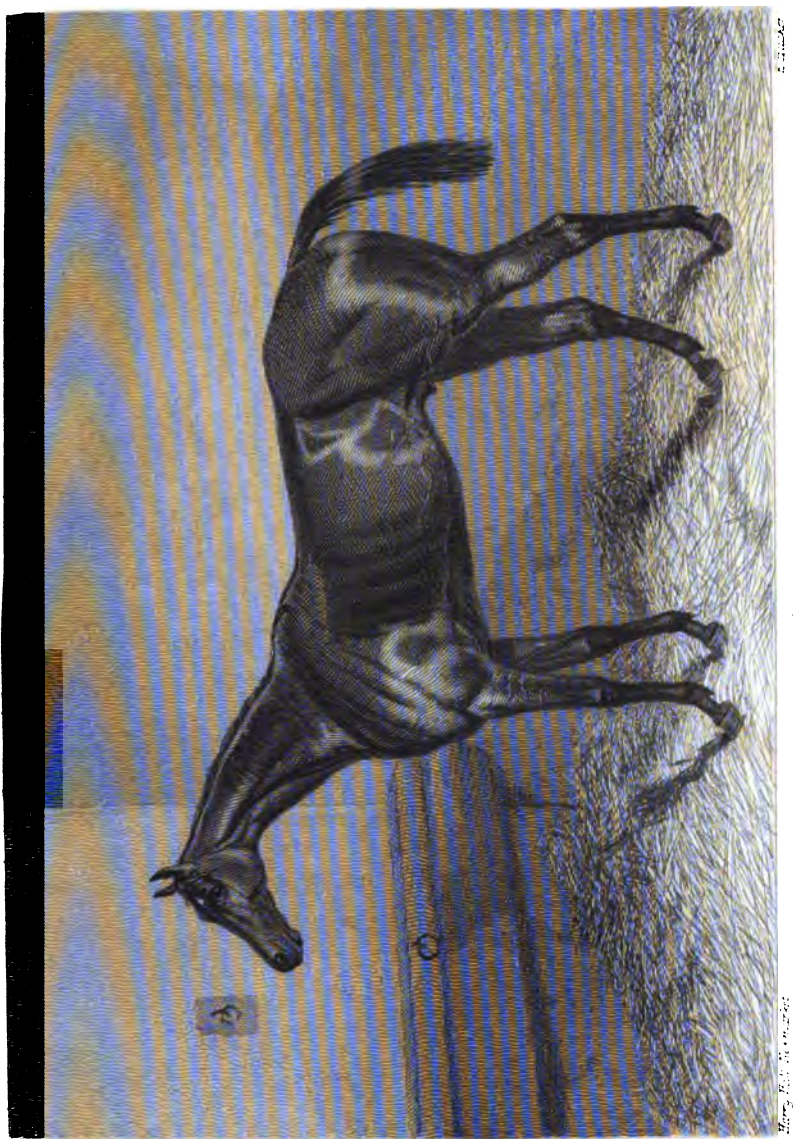




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*Stallion*  
*Winner of the 2000 Guineas in the Derby and St. James's 1840*  
*by the name of the "Stallion" and "St. James's"*



### PLATE III.

#### SOBIESKI; A PRIZE DEVON BULL.

THE PROPERTY OF MR. JOHN SOBEY, OF TREWOLLAND, LISKEARD.

Sobieski (728) bred by Mr. Sobey, and calved on October 13th, 1860, is by Duke of Chester (404), out of Brown (1196), by Alfred (138), her dam Beauty (29), by Duke (30)—Famous (163)—by Watson (129)—Pretty Maid (366)—Curly—Old Curly. Curly and her dam were considered by Mr. Francis Quartly to have been the two best cows he ever bred.

Duke of Chester (404), bred by Mr. John Quartly, and calved in 1857, was by Australian (365), out of Prettymaid (367), by Baronet (6),—Pretty Maid (366),—Curly. Duke of Chester took a first prize at the Chester meeting of the Royal Agricultural Society, and hence his title.

Brown (1196) was also bred by Mr. John Quartly, and calved in 1854.

In 1863, Sobieski, as the property of Mr. Sobey, took the second prize at the Liskeard meeting of the East Cornwall Society; and the first prize at the Truro meeting of the Royal Cornwall Society.

In 1864, Sobieski took the first prize at the Liskeard meeting of the East Cornwall Society; and was officially declared by the judges to be the best of his class at the Salt-ash meeting of the Royal Cornwall Society; but he was excluded from com-

petition in consequence of coming a few minutes too late on to the ground. In the same summer he was highly commended at the Bristol meeting of the Bath and West of England Society.

In 1865, Sobieski took the first prize at the Falmouth meeting of the Royal Cornwall Society, and the first prize in the all-aged class at the Plymouth meeting of the Royal Agricultural Society of England.

There was a deal of discussion over the Liskeard award in 1863, the majority of the spectators contending that Sobieski should have been first; and Lord Clinton's Baronet, placed before Sobieski at Bristol, received only a high commendation when they met again at Plymouth. We here spoke of Mr. Sobey's bull as "a very handsome, thick, square animal, with plenty of size to back his breeding"; and he won very handsomely in a class that was generally commended. Sobieski was never forced when young, and never had a dose of physic but once in his life, and that was at Bristol, when he took a chill on that bleak Durdham Down. He is a capital stock-getter, and Mr. Sobey has some very promising things by him coming on, that no doubt will be heard of at Liskeard and Falmouth, if not even at another Royal show.

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### PLATE IV.

#### GLADIATEUR;

WINNER OF THE 2,000 GS. STAKES; THE DERBY; THE GRAND PRIZE OF PARIS; AND THE ST. LEGER, 1865.

Gladiateur, bred by Count Lagrange at his stud farm at Dangu, in Normandy, in 1862, is by Monarque out of Miss Gladiator, by Gladiator, her dam Taffrail, by Sheet Anchor—The Warwick mare, by Merman—Ardrossan.

Monarque, bred in France in 1852, is by The Baron, Sting, or the Emperor, out of Poetess, by

Royal Oak, her dam Ada, by Whisker—Anna Bella, by Shuttle—by Drone. Monarque's name is already familiar to us on this side of the Channel, as in the Count Lagrange's colours he won the Goodwood Cup in 1857, and the Newmarket Handicap in 1858; while he is the sire of Beatrix, Fornarina, Infante, Villafranca Gédéon, Hospodar,

Le Maréchal, Brioche, Le Mandarin, and Rothomago, all winners in England.

Miss Gladiator, bred by M. Aumont, and purchased at his sale by Count Lagrange, is out of Taffrail, a mare sold by General Peel to Count Waldstein, who shipped her for Germany in 1853, but subsequently transferred her to France with a number of others that M. Aumont took in a lot. It may be as well here to correct an error which has appeared in some of the sporting papers as to Taffrail having been bred by General Peel, whereas she was bred by Lord Wenlock, and claimed by the then Colonel Peel for a couple of hundred after winning a plate at Newmarket.

Gladiator is a bay horse with black legs, standing close upon sixteen hands and one inch high. He has a big, plainish, but sensible head, well put on to a beautifully arched neck, and this again fitting into powerful well-inclined shoulders, backed by muscular arms and thighs, with good depth of girth. He is, however, light in his back ribs, and has but a middling loin—the weak place in his conformation—while he rather droops in his quarters, and, with plenty of bone and substance, has two suspicious-looking enlargements on the fore fetlock joints, but which, being the result of accident

and not of work, are of no actual detriment. As we said when we saw him in the paddock, the most thoroughly furnished horse of the lot, and got fit as he never was got before, with the great hard muscle starting out all over him, Gladiateur, even here carried everything before him. Indeed, with his steady, resolute, business-like air and a straight free walk, he was “almost” a grand horse; as seldom or ever has one been more thoroughly prepared.

Previous to the St. Leger an objection was lodged against Gladiateur as not being of the right age, but the stewards refused to entertain it.

The Count Lagrange certainly deserves his triumphs, from the spirit with which he has gone into the business of racing, as on his stud farm at Dangru there are now five stallions, forty brood mares, thirty-six yearlings, and thirty foals, with sixty more horses in work at Royal-Lieu and Newmarket. There is thus plenty to pick from, and with some of the best blood in the world to breed from, and the finest climate in the world to breed in, it would be strange if our French friends could not now and then bring out a clipper; as they most assuredly have done in Gladiateur, a long way the best horse of his time.

## THE SHORES OF NORTH DEVON.

BY CUTHBERT W. JOHNSON, F.R.S.

It was in September of the present year that I had the pleasure of exploring the glorious shores of North Devon—an iron-bound coast, deeply interesting in all seasons, but still more lovely in such brilliant sunshine as that of September. As I expected, I met many well-known farmers from different portions of our island—agriculturists who have, owing to the difference of climate and soil, to practise other systems of cultivation than that followed by the men of Devon. We all agreed, however, in the conclusion that no portion of our country was more worthy of an autumn's tour than the district between Clovelly and Lynmouth. If the traveller commences at Clovelly, he will be struck, as he approaches this little fishing port, with the long, densely-wooded drive of two miles, made by Lady Williams, and which, like Clovelly itself, is formed on the sides of the fine cliffs which overhang the sea. The closeness of these luxuriant woods to the salt water will not escape his attention, or the success with which they withstand the sea-spray.

The farms of North Devon, especially between Bideford and Clovelly, the tourist will find small, and chiefly devoted to grazing. The moisture of the climate, in fact, is opposed to the extensive cultivation of corn, but well adapted to that of the grasses and roots.

It is not, however, on the table lands of Devon—such as those which occupy the twelve miles between Bideford and Clovelly—that the visitor must seek for the beauties of this great county. Let him spend a few hours, when at Bideford, in exploring the valley of the Torridge—let him mark well the scenery of that of the Taw, as he glides down the North Devon Railway; that of the ten miles' stage between Barnstaple and Ilfracombe; and, above all, the valleys of the East and West Lynn—bright mountain torrents, which roll down from Exmoor Forest, and, amidst the boldest of rocky beds and dense woods,

minge their waters at Lynmouth. Let the agriculturist from our eastern or midland counties select a bright day for his visit, and he will never feel tired of wandering amid such scenery.

Most of the waters of the streams flowing from Exmoor Forest possess, like those of the East and West Llyn, a slightly brown tinge. These moorland waters were alluded to by Mr. Robert Smith, when he was describing the hill-side catch-meadows of Exmoor (*Jour. Roy. Ag. Soc.*, vol. xii., p. 139). He observed that in changing his residence from the east to the west of England his attention was naturally directed to the agricultural practices of the neighbourhood, which he found so directly opposed to those of his native county—Lincolnshire. On reflection, he adds, “I found that it was climate alone which dictated these opposite methods: thus, while our dry districts had their foundation in the growth of corn, the humid districts of the west had their merit in the production of roots and grass, and consequently of stock. Nothing could exceed my admiration of the ‘water meadows’ in early spring, a period (in the east) when I had been wont to value a blade of green grass as a rare production. To see the Exmoor ewes with their early lambs feeding (in January) upon the verdant meadow to me was a miracle—first, the early period of lambing, and secondly, the green meadow at such an inclement season. But if we turn to nature as our guide, we find the green grasses ever springing at the water's edge, and yet doubly verdant at the spring, even to the very summit of our forest hills, at an elevation of 1,000 feet. Thus these practices of agricultural art are dictated to us, and are alone waiting the skill and enterprise of man to cultivate and extend them. In my early inquiries as to the profitable formation of ‘catch meadows’ on Exmoor, I found much importance attached to the quality of water for irri-

gation, the general remark being that 'warm springs' were found best for irrigation. Experiments were therefore instituted; and these went to show that the waters flowing from the wet, peaty hill-tops, and joined (or not) in their course by the waters from the uncultivated valleys, were dangerous agents; while in every case where proper drainage had been practised the water flowed in a pure and healthy state, and at the stream's side were to be seen green and improving grasses."

The breed of Devon cattle will not escape the continued attention of the visitor. Their bright red colour, their graceful shape, their handsome small heads, their light and nimble step (and they are nearly all alike) distinguish them from all other of our several valuable breeds of cattle. The North Devon cattle were well described by our friend Robert Smith, of Emmett's Grange, in Exmoor, a few years since (*Jour. Roy. Ag. Soc.*, vol. xix., p. 368), as having been "long recognized as one of the earliest English breeds. Even in 1808 they are mentioned in 'Vancouver's Report of the Farming of Devonshire,' 'as an important breed of animals, active at work, and their aptitude to fatten unrivalled.' Their natural locality is around North and South Molton; but, verging away from this neighbourhood in every direction, more especially to the eastward, where we find the Wiveliscombe and West Somerset classes of Devons, they then merge into other breeds, or are changed by climate and circumstance. The true type of the 'old Devon' is peculiar to North Devon. Here they have long revelled in their bracing, yet humid air, where nature clothes them in early autumn with dark curly coats, well adapted to their native home, at the foot of the Exmoor mountain range.

"They were amongst the earliest breeds to be removed from the home of their fathers; but they did not enjoy themselves on distant soils in equal ratio with other breeds, especially when destined to consume artificial food for the purposes of a corn farm; yet, as converters of vegetable into animal food—breed against breed—they were found to return as much per acre, or for weight of food consumed, as any other breed.

"The Devon steer is described even from early times as being much sought after by the graziers and dealers from the midland and south midland counties. Vancouver states (1808) that the Devons were then declining in their general standard of excellence and numbers. He traces it to 'the great demand which has been made for these cattle from other parts of England, where the purchasers (Mr. Coke and others) spare neither pains nor price to obtain those of the highest proof and beauty.' Great merit is due to the late Mr. Francis Quartly, of Molland, who perceived that the best animals were being drawn from their native soil, and systematically purchased the choicest cows he could procure. Mr. T. D. Acland, in his 'Report of the Farming of West Somerset,' makes honourable mention of Mr. Quartly's patriotic and successful exertions. About the year 1831, cattle shows began at Exeter. Some good Devon breeders carried-off the early prizes; but in November, 1835, Mr. Quartly allowed his nephews to enter in all the twelve classes at Exeter, and they brought home the twelve prizes. In the previous year, Mr. Quartly gained eight prizes out of ten."

The butter of North Devon is large in quantity, and excellent in quality: it is commonly made in a way rather different from that of the dairies of other counties. I was sometime since obliged to a North Devon farmer's wife for the following account of their dairy management. "Cows are milked twice a day, morning and evening, and the milk strained into the milk pans, which are generally made of tin, and should not be too deep, or the milk will not cool quickly. Early the next morning (as soon as the

fire has attained a sufficient heat) the milk is placed on the stove or steam apparatus, to be scalded, beginning with the previous morning's milk until all is scalded. There should be from 12 to 16 pints in a pan, and, with a proper heat, it will take from 20 minutes to half an hour to scald. When it is sufficiently scalded you will see the cream look rough, and a ring or mark will appear on the surface just the size of the bottom of the pan. After scalding, the milk is placed in the dairy to cool; and on the following morning the cream is taken up from each pan with a skimmer, and placed in a large bason, where it remains until it is removed into the tub, to be made into butter. In the summer butter must be made every day; in the winter three times a week will be sufficient. When you make butter you must pour off any clear or thin cream there may be in the bottom of the bason, and then put the thick cream into your butter tub; stir it with your hand, or with a stick, round the tub, all one way, until it becomes a very thick substance; continue turning it until you see milk coming from it, then pour off the buttermilk and wash well the butter with cold spring water until there is no milk left in it, and the water is quite clear; then add a little fine salt to make it a proper saltiness, wash it again, and continue working it with the hand or stick, as may be, until you cannot get a drop of water from it; then weigh the butter and make it up into pounds. If this plan is strictly followed your butter cannot fail to be excellent. In very hot weather the morning's meal of milk must be scalded in the afternoon, and the evening's meal early the following morning, to keep it sweet. The stick used in our dairy, and which is preferable in every respect to the hand, is formed like a small spud, with the handle about 12 inches long. When the red earthenware pans are used for the milk, it takes nearly an hour to scald each pan. We consider tin pans preferable, for two reasons—first, economy of time in the dairy work; second, the milk in hot weather is less likely to turn sour when quickly scalded."

The clouted or scalded cream of North Devon every tourist will remember. It is made by warming the milk about twelve hours after it is taken from the cow. It is an erroneous opinion, that by scalding, a larger amount of cream and butter is obtained. The effect of scalding is rather to reduce the amount obtained than otherwise. Neither is there any difference in the composition of the butter obtained by the two processes. The practical advantages of scalding cream are, that the butter is quickly made by stirring with the hand or with a stick, and that it keeps much longer.—*T. D. Acland, ibid.*, vol. xi., p. 735.

The visitor to Exmoor will hardly omit to notice its breed of active and hardy ponies, whose quality has been much improved of late years. Here also let Robert Smith of Exmoor be heard. He says: "The mountain pony is an indigenous animal peculiar to our mountain ranges, whereby the rough grasses are turned to account, which would otherwise decay and be lost. The original pony has been much improved. The native pony of the New Forest in Hampshire was enlarged and improved by the presence of 'Old Marske' amongst them; the Exmoor pony, by an infusion of the English thoroughbred and Dongola horse; the Welsh pony has been crossed with the Norwegian; the Dartmoors are nearly extinct; the Highland pony is still the old hardy animal nature formed; the Shetland pony of the northern Scottish isles is still diminutive, but beautiful. The infusion of larger males amongst the old mountain race has increased their bulk, while their pony form and hardy constitution have been preserved. The severity of winter-storms drafts many an inferior animal from this larger breed, leaving the breeder to reflect on the inevitable operation of nature's laws. The galloway is indeed a treasure when well pro-

duced. The first cross from the pony mare with a small thoroughbred horse is generally the real animal for safety, quickness, and endurance. There is ample record of the wonderful performances of this class of animal, either for the field, the road, the park, or lady's carriage. The best are graceful indeed. Being a galloway breeder myself, and to some extent from the Exmoor pony mares, I have taken the opinion of a first-rate judge as to the qualities required in them. He writes to me—"I wish you to breed some galloways (a few to begin with) of the following kind: long, low, and full of quality; deep shoulders, light necks, and small heads, with large nostrils and hawk's eyes, for which I will give £120 each."

Besides the ordinary farm and artificial manures generally used, the farmers of North Devon employ to a large extent the calcareous sand of the sea-shore. This sand is either carted up the steep roads leading from the sea, or in those places where the incline is too considerable, it is carried on the backs of donkeys on to the top of the cliffs, and from thence is carted inland to considerable distances. This use of sea-sand, which we noted in several places in North Devon, becomes more extensive towards the west—not only in Devon, but in Cornwall, where even a railway has long since constructed, chiefly to convey the sea sand of Padstow harbour into the interior of the county. This sand, as Mr. Tanner observes (*ibid.*, vol. ix., p. 469), is found on several parts of the coast of Cornwall, but North Devon is chiefly supplied from the neighbourhood of Bude, where it forms a large bank on the sea-shore of considerable length; and although many thousand tons are removed every month, no decrease is observable, the loss being restored on the return of the following tide. This sand forms the principal article of traffic on the Bude and Launceston Canal, depôts being established on its banks for supplying the district through which it extends. By a microscopic examination it appears to consist of the

fragments of common coast shells, amongst which are oysters, scollops, cockles, and muscles, with the spines of sea urchins. These live between low tide and thirty fathom water, and are therefore readily brought under the influence of the breakers. On arable land it is generally applied at the rate of from eleven to thirteen two-horse cartloads per acre, before ploughing for wheat. It is a valuable manure for grass land, and produces a sweet and luxuriant herbage. The rotation chiefly adopted in this county is known as "the old Devon course," viz., turnips, wheat, barley, oats, seeds, two to six or more years. It is climate, indeed, that ever materially influences the mode of cultivation. Thus, as Mr. N. Whitley remarked (*ibid.*, vol. xi., p. 38), a summer temperature of from 54 deg. to 59 deg. includes the degree of heat best adapted to the oat. Where the temperature exceeds 59 deg., barley is grown on suitable soils. In the moist climate of Ireland ten acres of oats are grown to one of other cereals. In Devonshire excellent crops are grown at Exmoor, 1,000 feet above the sea, yielding 60 bushels per acre. On Dartmoor, at 1,100 feet, oats answer well, the harvest being about a fortnight later than on the low lands. The wheat plant often suffers by the mild wet winters of Devonshire. The plant is kept in a state of excitement during a mild February and March, only to be cut down by a frost, or injured by a north-west wind. In the spring a continuance of warm moist weather produces a great bulk of long flaggy straw, which is laid by the westerly gales, or by a few showers of rain.

The agriculturist, then, who from drier and consequently better corn-growing lands, wends his way into North Devon, will long remember the scenes he has visited. He will, as soon as he looks out from the Castle Hotel at Lynton, arrive at the rapid and correct conclusion that he is in a land full of beauty, and where health and deeply interesting objects on all sides abound.

## THE DEATH OF LORD PALMERSTON AND THE CONSEQUENCES.

The death of the Prime Minister of England when holding office is an event of such rare occurrence as of itself to create a sensation. Ranking as only next to the sovereign in public importance, the loss of such a personage is at once acknowledged. For Lord Palmerston, however, the feeling is a far deeper one, as he was not only the most eminent, but at the same time the most popular man in England. So happy a combination of good qualities it has seldom been the fortune of humanity to possess; for with all his really hard work in office, with all his increasing years, and his grave responsibilities, the Premier was the most cheerful and genial gentleman of his day. As with good wine, age but served to improve him, and it was only as he ripened that the world came to recognise his real excellence. Lord Palmerston, to be sure, might have adroitly suited himself to circumstances as the occasion required, but whether as Foreign Secretary or first Minister, he had ever the most jealous regard for the honour of his country; he might have despised the solemn bearing of the mere prig, who endeavours to look as wise as an owl and know as much, but never in act or thought was he deficient in true dignity; and, if the foreigner feared him, his own people loved him, because he was at heart as in manner so genuine an Englishman. At his decease, as for long previously, no one carried so great a sway. The very tact with which he managed his own Party gave the Cabinet the confidence of the country;

and if ever the welfare of the State depended upon an individual, this was the case with Lord Palmerston.

Such a fact only serves to emphasize the loss of so successful a man, as it suggests the continual changes which may be the consequence. With Lord Palmerston removed from the face of it, the political world appears to be split up into almost innumerable sects and coteries, without the name of anyone offering itself as likely to command so incongruous a company. Even confining our reference to those at present in power, it is well known that Lord Palmerston's influence and discretion have alone kept the Ministry so long together. We have brilliant orators, plodding economists, rising young statesmen, and well-trying veterans; certainly neither genius nor experience is wanting in our emergency, but that which we do need is some one with weight enough to follow the late Premier. Putting his general popularity out of the question, is there anyone with sufficient power, even amongst his fellows—anyone who can reckon upon the support that must make and rule a Government? In any private circle half-a-dozen people would most probably propose as many different candidates for the office, and throughout the country there would seem to have been an equal uncertainty. Want of position, want of temper, or want of executive ability, have alike been urged against the more prominent members of the present administration; while, from the other side, Lord Derby is more

than loath to again going very actively into harness, as neither Mr. Disraeli nor Lord Stanley has quite the sympathies of his associates, and the democratic dominion of Mr. Bright is still in hazy perspective.

The deduction to be drawn is surely inevitable. The secret of the last long Parliament was simply Lord Palmerston. A new House, whose constitution was more or less a compliment to the man himself, will meet to meet a new leader. Whatever may be its leaning, from a purely party point of view, at a time when the divisional line of party has almost faded out from amongst us, the majority was essentially the Premier's own. And Fate has now delivered this over to the hand of another. Rarely has there been a greater or more direct responsibility. The Old Guard, hampered possibly with many a raw recruit in their ranks, miss the hearty greeting of their old General, and fall in to the cold word of command from another Captain.

We would wish in no way to disparage the services or experience of Lord Russell, to whom Her Majesty has been pleased to entrust the delicate business of forming a government. But the new Premier does not start fairly. The House of Commons, wherein he himself figured so long and so prominently, and where of course the actual power centres, is not of his calling. The chief officers of his Cabinet may even not be precisely of his own choosing, but the rather remain, as he may continue them, through a time of passing difficulty. The result, then, we repeat, may be surely anticipated; or at any rate it is a duty to advise the country to stand prepared. There is little probability of another long Parliament; on the contrary, Lord Russell would be justified in a dissolution on the first embarrassment he may encounter. The very antagonism of

personal interests or prejudices may conduce to such a difficulty, to say nothing of the renewed energy with which the Opposition will now lay siege to office. There were few bold enough of late to bid for power against Lord Palmerston; but there are many who will give freer bent to their ambition, now that he is removed. In such a state of transition, when the country is watching the conflict and directing the storm, the pressure of any question of common justice and general good may be put with more and more effect. Let the farmers look up their representatives closer than they hitherto have done. Let there be no mistake as to the course of action honourable gentlemen are going to take on behalf of the agricultural interest. We may rest assured that other classes will be alive to the occasion, whether it be the Reformers after Lord Russell's own heart, the extreme outsiders who have Mr. Bright for their champion, or any other particular set of citizens with a grievance to get righted. Never did a Government promise to be so susceptible to attack, or, in nicer phrase, so open to reason. A Chancellor of the Exchequer with Lord Palmerston at his back might afford to pooh-pooh a petition for the repeal of the malt tax, knowing as he did the centrifugal force that would carry him through. But he feels that he can count upon this no longer, as that his tenure of office may depend upon the good-will of a deputation of country-farmers; that is if the farmers are so far true to themselves as to select representatives in which they can trust. The death of Lord Palmerston is a national loss; but still under the shadow of his name many an eccentric piece of legislation was thrust upon the country by his colleagues, who will now have to study the requirements of the people rather than to humour their own peculiar fancies. Even a Budget can be no longer a mere series of surprises.

## SPEAKING TO THE POINT.

It is an encouraging sign to see the way in which the business of agriculture has been spoken to from the high table during the autumn. In Shropshire, to be sure, the scared Squires fairly run for it, when the after-dinner debate takes a really practical turn; whilst elsewhere the landlords and M.P.'s have been the first to direct the discussion into a more profitable channel. Thus at Docking, last week, we had Lord Leicester manfully broaching many of the topics that farmers have at heart, and, as we must do his lordship the justice to say, without trimming his own opinions to suit those of his audience. For instance, after all that has so recently occurred in the county, the Lord-Lieutenant still holds to his own views on the Malt-tax, as that "were the duty repealed the poor man's wife could never brew beer, and the money spent in the attempt had far better be employed in the providing of other luxuries or comforts for her husband's home." However unpalatable such a sentiment may be to some of the barley-growers of Norfolk, or however ready many might be to dispute such premises, the manner in which the speaker courted rather than avoided so ticklish a question testifies of itself to the honesty of his intentions, and we are prepared accordingly to follow him with increasing respect. It was only last week, indeed, that, as fitting in so well with the subject we were dealing with, we had to quote Lord Leicester on the rating of woodlands and preserves, and he referred quite as forcibly to another matter, in which by way of properly adjusting his burdens the farmer is equally interested, as his lordship pointed the argument

by example of his own immediate district: "I must now congratulate this union as being the only union in this country which has adopted that wise measure of a union settlement, and of having given a precedent to Parliament for passing an Act which will do more to benefit the labourer than any other measure that has been hitherto attempted on his behalf. Up to the present time our duties and interests have been apparently antagonistic. I say apparently, gentlemen; because we had begun to learn that unless we provided proper cottage accommodation for our labourers within a reasonable distance of their work we were likely to lose the services of our best labourers. We also considered that it was better to open our close parishes, and be subject to provide for the aged and infirm, rather than to depend upon the supply of our labourers from the distant and open parishes. That the evils which existed under the old law can be immediately remedied is impossible. Before the Act that was called the New Poor Law was passed, there were certain parishes on this estate that paid 19s. in the £ poor-rate. Certainly at that time, if it was not the duty, it was the policy and interest of owners of property to endeavour to diminish the population and not to increase the cottage accommodation. But railways and other causes have entirely altered the position of the employers and employed. But after all that can be done or has been done by Parliament or by societies like this, the physical and moral improvement of the labourer must mainly depend upon his landlord and upon his employer." The value of such a declaration from such a quarter can scarcely be over-



estimated, the more particularly when we remember the opposition with which Mr. Villiers' Bill was met by the Knightleys, the Bankes Stanhopes, and the country gentlemen of that school, aided and abetted as they were by good old Mr. Henley, who did all they could to prevent "the passing of an Act which will do more to benefit the labourer than any other measure that has hitherto been attempted on his behalf." We have this, be it borne in mind, on the word of one of the great landlords of England, and who has himself a more intimate acquaintance with the condition of the rural labourer than perhaps any other man of his order. Lord Leicester did not make a long speech, but he made a very good one, which we give at length in another column; and that, however much or little we may agree with him on certain points, cannot fail to do good. It is wholesome, after all that has happened, to see anyone of so much position, instead of leaving the room when it really came to business, the first to follow up every argument, whether this turn on thatching a rick or framing an Act of Parliament.

But Lord Leicester is well matched from the other side, as unquestionably two of the best, or, in other words, two of the most useful addresses of the season have been delivered by Mr. Disraeli. It was the wont of some small wits to refer at such a time to the right honourable member for Buckinghamshire in his famous impersonation of the British farmer; but bringing the force of his genius to bear upon the character, it is certain that few have studied the part with more success. Mr. Disraeli backed his speech at Aylesbury by another equally good at Amersham, the other day, when he touched upon a variety of topics, though on none with more effect than the share which the labourer should claim in such celebrations:—"I have not changed my opinion as to the expediency of rewarding long service by a pecuniary donation; and although that has been a subject of considerable controversy, I know, as you all do, that this is a recognition of merit which the men substantially appreciate. And so long as the labouring classes associate with them the feelings which they do at present, it would be most unwise, and give rise to great and painful misconception, if we were to terminate them. Recollect, you must estimate the value of a reward of £3 to a labourer in proportion to his income: £3 to a labourer with 12s. a-week represents a sum equivalent to £500 or £600 to a gentleman with £5,000 a-year. Now I have observed that gentlemen in the receipt of £5,000 a-year are not absolutely indifferent to the chances of receiving £400 or £500 extra. Why the income-tax, about which the gentlemen with large incomes make such a noise, does not amount proportionately to anything like the sum which is obtained in addition to his income by one of the agricultural labourers whose moral virtues and whose industry are recognized by this system of rewards. With regard to the other prizes, there can be no controversy. Careful shepherds, industrious ploughmen, skilful hedgers and thatchers—as we have in the southern part of the county, though you have not here—why should not their merits be recognized by those amongst whom they live? There is another point touching the condition of the labouring population which this and similar societies have attempted to influence—I mean their habitations. You offered pre-

miums for keeping cottages in good order, for the cultivation of gardens with the greatest industry and taste, and in other modes sought to encourage a feeling of the respectability of home among the labouring poor. Gentlemen, that is an excellent object; but there were, I believe, domestic difficulties connected with the inspection, which have thrown obstacles in the way of the continuation of the prizes for the best-kept cottages. But generally the premiums offered by this and similar societies for the cultivation of cottage gardens have been productive of much good." This is all very excellent, avoiding as it does any injudicious extreme—either the austerities of the Bedford authorities, who would allow of no public recognition of long service and good conduct, or the absurdities of the Kingscote officials, who would set down a ploughman to pen prize essays. Premiums for the cultivation of gardens or allotments should be as useful as similar distinctions for farms, crops, or cattle; but we should hesitate, with Mr. Disraeli, as to offering prizes for well-kept cottages. The privacy of the poor man is too often invaded already, and with a prying curate and a busy body Lady Bountiful for judges we can picture nothing much more offensive than such an inspection. The member for the county had also of course something to say to his constituents, and Mr. Disraeli followed up a subject it seems already started, with all that good common sense he brings to bear upon the actual business of life, however eloquent he may become when the occasion requires:—"It is very well to say a farmer ought to have a lease; but you must consider the terms of that lease, and you will find, when you come to discuss these terms with one who would be your tenant, that very different ideas are attached to these conditions from those which are entertained by another. Mr. Field said a farmer should have a lease or tenant-right; but a lease and tenant-right are two very different things. Mr. Pusey was one of the best authorities on this matter who have flourished in our time, and to his proposition, with regard to tenant-right I was always favourable. I remember hearing him say in the House of Commons—although he was a man to whom agriculture and husbandry are more indebted than to any other man in our generation—that rather than let land on long leases, he would refer to have no land at all. The fact is, the arrangements under which land is held must vary according to the soil and customs of different counties. I do not think any abstract principles can be laid down on the subject. But this is quite clear, that permanent improvements ought to be done by the landlord; and if that be done, there are very few tenants, I think, who would wish to embarrass themselves with leases." And yet in the face of all this, with the fact before us that the best cultivated land in the kingdom is farmed without leases, we hear every now and then of Mr. Pusey and his labours being derided by some unknown upstart, whose sole object is to push himself into notice, and to advertise for customers. Arrangements must vary according to the soil and customs, while no general principle has yet proved sounder or worked better than the Lincolnshire Tenant Right. It would be impossible to frame a model lease adapted to all districts; but the system of compensation for unexhausted improvements might be made everywhere applicable.

## THE GAME QUESTION—MR. BRIGHT'S LETTER.

With Mr. Clare Sewell Read *is* for Norfolk, and Sir Baldwin Leighton *out* for Shropshire, we have every precedent for some further reform in the constitution of the House of Commons; while it is self-evident that any such change will tell mainly against the country gentlemen. If the member for the county will remain supine as to the Malt Tax and obstinate as to the Game Laws, his fate can only be a question of time, as even the interest of a Lord Lieutenant will not be able to keep such a man in his place. The world is fast coming to see this, and the Press is just now circulating a letter throughout the length and breadth of the land, urging the adoption of such a course as the only way of mitigating the many evils consequent on the excessive preservation of game. To be sure, the writer is Mr. John Bright; but then his communication is addressed to a Farmers' Club, the members of which have sought the honourable gentleman's advice under a difficulty that is getting past endurance. Mr. Bright goes to the point with little or no hesitation: "There is one thing which the farmers may do for themselves, whenever an election for a county takes place. At present they are not asked who shall pretend to represent them, but the lords and squires of the county name the candidate, and, as a rule, the tenant-farmers vote for him, and he enters the House to do the work of the lords and squires who selected him; a main part of that work is to keep guard over the laws which favour the preservation of game. The time is coming when tenants will dare to believe and act for themselves in the performance of their political duties. They can combine with great ease, and when combined their power is irresistible. I hope the day may soon come when they will take the election of members in the counties in some degree into their own hands, and when this is done their political and social deliverance will be secured." There can be no possible dispute as to the truth of all that is here stated, or as to that future for the farmer, should he be driven to taking his case into his own hands. At the same time, it must be remembered that such an exhortation does not come with the best grace from Mr. Bright. Since the promises they made to the producer on the repeal of the corn laws, what have the Free-trade party done for the agriculturist? As a body, or as Mr. Bright in particular, nothing whatever. They have the rather held carefully aloof when any rural matter has come on for consideration, as the real object, even here, is palpable enough. With all his well-practised ability Mr. Bright would most probably have turned almost any other question round to precisely the same answer. To obtain any relief you must join with us in what we are going for—a democratic House of Commons. "I see only one way in which any real improvement can be made. It can only be done by having in Parliament a larger number of representatives of the people, and fewer representatives of a class, and of the prejudices and usurpations of a class. How can this be brought about and secured? By the admission of another million of the people to the elective franchise, so that the House of Commons may become truly representative of the true interests and wishes of the nation." This is manifestly the panacea; and Mr. Robotham, who introduced the subject at the meeting of the Midland Farmers' Club, appears to be very much of Mr. Bright's way of thinking, taking the letter indeed from which we have quoted

as "the best conclusion to his paper." But the other members of the club could scarcely go so far as this, and after some discussion which is reported at length in this number, wound up the business of the evening by passing, as it strikes us, a very sensible resolution, which was: "That this Club desires in the most emphatic manner to call attention to the serious losses which are being inflicted upon tenant farmers in many localities by the excessive preservation of game, and to the necessity that exists for a general and earnest appeal to be made to landed proprietors in order to induce them to take immediate steps to mitigate the evil." Now who is to decide here? Mr. Bright says the main work of "the gentlemen" is to keep guard over the game, and that what we must go for is the repeal of all laws made with the object of favouring the preservation of game. The farmers, on the contrary, confine their complaint to the excess of game maintained, and the necessity for this being immediately reduced. Again we ask, who is to decide between the two sides, the ultra and the moderate party? But the very wording of the resolution suggests an arbitrator; and this one must be the landlord himself. For the present, at any rate, the question is left in his hands. Will he take immediate steps for lessening the losses inflicted upon his tenants by this monstrous system of game-preserving? Let him not shrink from the point for a moment. It is simply idle to talk of compensation or valuation for damage done, for all practical men know how utterly impossible it is to estimate this. Let the lord declare at once, the rather by his deeds than by his words, if he will be content henceforth with fair sport instead of sheer slaughter. If he will, the farmers will be the first to go with him; and that such a plan can be carried out was shown at this very meeting by one of the land agents present, Mr. Bigge, who acts for Lord Wenlock, and who made by far the most effective speech of the evening; in the course of which he said "he had thought a good deal on that subject; and as he happened, he was glad to say, to be in a position to try an experiment on the question of game as between tenant-farmers and landlords, he immediately set to work to put it in force on some estates in Shropshire which he had the honour of managing. The first thing he did was to discharge all the game-keepers on the estate. Having done that, at the audit-dinner he mentioned to the tenant-farmers what he had done, and he was glad to say it met with their full approval. At the same time he intimated to them that the landlord was fond of shooting; that he wished to reside on his estate, and wished to live in amity with all his tenants. They one and all said they were certain they would preserve more game on that estate than the keepers did. At the same time they had liberty to destroy, at every season of the year, by ferrets, but not to shoot on their farms. With this they were quite satisfied. This year there was an exceedingly good shooting season. Instead of killing 250 brace in a week's shooting, nearly 400 were killed. That was a practical proof of what tenant-farmers, if they were treated in a liberal, straightforward manner by their landlords, would respond to." We have ourselves urged the adoption of such a system over and over again; while as some further proof of how the straw is shaking we may refer to the speech of Lord Leicester at Docking on the day following, and who, though hitherto a heavy game preserver, thus expressed himself: "There has been lately a very

wise and proper readjustment of the rates of our respective parishes, but there are certain descriptions of property that I think are unwisely exempted from being rated. I see no reason why the 2,000 acres of wood that I hold in this county—retaining them as I do for the purposes of game or ornament—all of which, if converted into pasture or arable, would be subject to rates, should not pay their quota to the poor-rates. This law was established years ago for the purpose of encouraging owners of property to plant timber for the purposes of the Royal navy, and when the reasons for that encouragement ceased the exemptions which were derived from it should have ceased also. I do not think that it would be right to value the woodland property at the same rate as the lands adjoining. That land has been brought up to its present state of value by skill and capital. The land that is under wood should be valued according to its natural value if converted into land for agricultural purposes. It has been argued that it would be by no means desirable to alter a law so as to encourage the destruction of our wooded districts. The love of sport and the desirable appreciation of ornament that exists in all Englishmen's breasts is such that in my opinion there would be no danger of any material decrease of the woodland districts of this country. The difference that would be made in the rate would be comparatively inappreciable; but it would remove an act of injustice, and it would prevent that feeling of discontent which I can quite understand exists in the breasts of many of those who are not the owners of this description of property." Now if, after such warnings on all sides, the Squire will still have his bands of keepers and watchers, and his three or four great days in a season, then we trust that the occupiers will go dead against him. The argument is rapidly coming to such an adjustment; as, we repeat, the landlords must decide for themselves, remembering as they do that the power is not quite all now in their own persons. There have been two or three

very awkward examples of late, and example is catching, and may be easily multiplied by another election. If the hares are to continue to eat up the tenant's produce, if he is still to suffer from the offensive surveillance of the keeper, and that preposterous paragraph of the killed and wounded is still to go its annual round, then we say that the farmer's course of action is clear enough. Let him temporize no longer with those who simply ridicule his remonstrances, but let him set about and do with all his heart all that Mr. Bright advises. Select, as he says, "a farmer's candidate," and he will be the popular one, as has already been proved. "The Liberals in the towns will give him their support, and you will carry him into Parliament to do the work of the farmers and people, instead of that of lords and squires." Or again, "Get absolute and undisputed ownership of and control over all animals which live upon the produce of the land. You can do much. You can do everything for yourselves—and there will be a revolution that will transfer the county representation from a dozen rich men or families to the real people of the counties." This reads harsh in comparison with the resolution passed by the members of the Midland Farmers' Club, but it is still the only alternative. Are the landlords, the so-called "sportsmen" of this country, open to reason? If so, here is their opportunity. If not, if they will still blindly persist in inflicting injury on an important class, and in wasting the food of the people, their sin must be on their head. They are putting a weapon in the hand of the enemy, and working their own downfall. But it will not be the first instance in either ancient or modern history where overbearing excess and absolute injustice have brought the Patricians to grief, and this democratic House of Commons hangs like a drawn sword over their devoted heads as they headlessly sleep on in self-satisfied security!

## HOW IS THE FARMER TO FIND CATTLE TO CONSUME THE CROP OF ROOTS?

When the first drought set in at the beginning of May, and it was necessary to sow the turnip fields over and over again, apparently to no purpose, great fears were naturally entertained that there would be a scarcity of winter food for the cattle and sheep. The hay crop was in many places not worth harvesting, and, in fact, so scarce was the feed on the pasture lands that what little grass there was, was eaten up to keep the stock alive. The rain set in at the latter end of June, and dissipated the fears of the farmers for the time. Both the turnips and the mangolds sprang up, as if by magic; whilst the meadows and upland pastures, which had hitherto yielded the most scanty produce by the first cutting, gave promise of a plentiful after-grass, which has been so far fulfilled. But the drought set in again, and arrested the root crops in their growth; and in the end the turnips and swedes showed symptoms of mildew, and the early ones of a stunted growth. Fortunately, before these drawbacks had attained any great height, so as to injure the plants irremediably, rain again came to the relief of the farmer, and a fresh growth was instantly apparent, even where the mildew seemed to have taken the strongest hold. Generally speaking, on the good land the plant is ample, and the late sown turnips will in all probability prove a good crop. We have both seen, and made inquiry of farmers in different parts of the country, and they all agree that there will be a fair crop both of turnips and mangolds, as well as a good produce of grass on the pastures.

Another difficulty, however, now presents itself, totally unprecedented and unlooked for, namely, how the farmer is to find cattle to consume the produce? We have seen several during the last fortnight who are precisely in this predicament, having a first-rate crop of roots, but not cattle enough to eat them; and in the present state of the cattle market, they are afraid to purchase any, under the apprehension of introducing the fatal disease into their herds. Unless therefore the approach of winter puts a stop to the pest, the root crops will be of little avail as food; most of the farmers being in the same condition in respect to the want of stock and the fear of purchasing. In the mean time healthy lean stock are selling at prices that will afford no profit upon grazing, unless the price of meat advances still higher than at present, which, in fact, appears the most probable result of the state of things. It will scarcely, however, be prudent to speculate upon this contingency, as the importation of fat cattle and sheep from the continent may be so much increased, *for the moment*, as to keep down the price of meat at market. The continental graziers cannot enlarge the number of cattle they export, *upon the average*. It is true, we have already seen that the price of meat in England has stimulated the trade during the last few months; but they cannot continue to do so, especially under the rigid restrictions to which the importers are now compelled to submit.

The destruction of the London dairies by the disease will make a sensible difference in the demand for winter fodder

and roots this season. Some of the largest establishments have been completely broken up, and the proprietors have wisely determined not to renew them by purchase whilst the disease is so prevalent. London is at present, in consequence, chiefly supplied with milk from the country, and it is not improbable that in future this mode will be the rule, if the country dairymen continue to supply good milk, and it does not get adulterated by the retailers. This novel state of things, we repeat, will materially lessen the consumption of both hay and straw as well as of roots in the metropolis, which will occasion a serious loss to the farmers in the vicinity, who have hitherto found a ready and constant sale for all they produced. With regard to the root crops, a large proportion of which will probably be left over in the spring, the best mode of disposing of them—where the covenants will not allow of their being removed from the farm—will be to chop them up and plough them in, when they will rot and furnish an excellent manure for the barley crop. This plan has been adopted by many farmers who have found their root crops too large for their live stock to consume, and where they

were not allowed to sell them off the farm. And when the high price of lean cattle, with the addition of the risk of losing them by the disease, is taken into the account, perhaps this would be the most profitable method of disposing of the surplus, especially when straw also is scarce, and not more than will suffice to supply the limited number of cattle that are held by the farmers.

Altogether, this will be one of the most trying seasons the farmers have ever experienced; and in many cases it may be attended with utter ruin. On the good lands the white crops turned out an average; but on the light soils the wheat crop proves terribly deficient, both in quantity and quality, and will involve a heavy loss to the grower. On the other hand, the cattle plague, which may decimate the herds both of cows and oxen, admits of no relief, in some cases the grazier not having a single animal left. It is to be hoped that the approach of the cold season will arrest this insidious disease; but in many cases the plague has done its work, and left but little room for congratulation on its cessation.

## THE PIG.

The pig, sow, or swine does not claim such a very high antiquity as the horse, ox, and sheep, the first notice occurring about 1,500 years before Christ, when the flesh was strictly forbidden as food by the Jewish legislators. The Mahomedans copied this interdiction, almost the only prohibition in respect of food. Swine are mentioned partially by the Greek writers, and the flesh was very largely esteemed in the early declining days of the Roman Empire. The nations of Northern climes have ever made a large use of swine, as the temperature allows the flesh to be treated in the proper manner. The filth of the animal may have caused the prohibitions against eating the flesh, which has descended to modern times in the aversion of the Jews, Egyptians, and the followers of Mahommed. Yet vast herds of swine have been reared in these countries, probably for the purposes of gain, and in order to supply strangers and the neighbouring idolaters; and the keepers or swineherds were considered as in the lowest possible state of degradation. The northern parts of Greece being cool in the climate, may have first used the flesh of swine as food, and broken the prohibition, which must have been carried along with the people from Egypt, from which country they emigrated.

The pig has been found as a native in the greater number of parts of the known world. The European varieties are all referable to the wild hog of Switzerland, which inhabits the moderate elevations of that Alpine country. The wild boar (the "*Sus scrofa*" of naturalists, var. "*Aper*") is of a dusky brown or iron grey colour, inclining to black, and diversified with black spots or streaks. The body is covered with coarse hairs, intermixed with a downy wool. These hairs become bristles as they approach the neck and shoulders, and form a kind of frame, which the animal erects when irritated. The head is short, the forehead broad and flat, the ears short, rounded at the tips, and inclined towards the neck, the jaw armed with sharp, crooked tusks, which curve slightly upwards, and are capable of inflicting fearful wounds; the eye full, the neck thick and muscular, the shoulders high, the loins broad, the tail stiff, and ended with a tuft of bristles, the haunch well turned, and the legs strong. The strength of the animal is great in proportion to the bulk, and fierceness grows with the age. The habit is neither wholly solitary nor very gregarious; the animal chooses dark abodes, and near to pools or streams of water in woods or forests. The instinct is herbivorous, and the choice feeds upon plants, fruits, and roots. Reptiles and small insects of the ground are devoured by swine, but flesh is not eaten in its proper state, putrid carrion is relished, but much discrimination selects the herbs of the earth. The sense of smell is very acute, and also of

hearing: the former induces the furrowing of the ground by the snouts in search of food, for which purpose the organ is very powerful. The hearing perceives distant sounds more readily than the noises that are close to the animal. The sense of smell and touch is exquisite, and resides in the snout, by which the animal is enabled to discover roots for food, though buried in the ground. Swine are employed to hunt for truffles, and the digging with the nose marks the place where the mushrooms may be found, and also gave the first idea of ploughing the ground. The pig was the first ploughman, the snout giving the idea of the coulter.

The wild boar is a very active and powerful animal—fierce and most dangerously savage. The fierceness increases with age, and is retained in the improved domestication in a considerable degree. The animal is viviparous, and the female produces but one litter in the year, which consists of several individuals, carries the young for 16 or 20 weeks, and suckles them for several months. She defends her progeny with exceeding courage and fierceness when attacked; but neither the boar nor the female are very aggressive, but enjoy a kind of solitary savage majesty in lonely retreats. When disturbed or attacked the animals quickly show the mighty power with which Nature has endowed them, outrunning very fleet horses, keeping dogs at bay, resisting the spear of the hunter, sometimes killing both horse and dogs, and endangering the life of the horseman. Hunting the wild boar has been a favourite sport in almost every age of recorded antiquity. The allusions are many in the Greek and Roman classical writers; and the animal formed a large part of sports, pageants, and shows of the fading days of Roman grandeur. During the middle-ages the European countries continued the amusements of boar hunting; and the animals contributed a part of the furniture of the feudal domains in forests and parks. The breed disappears before the increase of population; and the barbarous pastime had ceased by the time of the Commonwealth in England. The wild animal is now chiefly found in Alpine Germany, and the hunting mostly practised in British India.

Swine appear to form an intermediate link between the whole-footed and cloven-footed animals in some respects, and in others to occupy the same ground between the cloven-footed and the digitative; but in any point of view these animals present various peculiar characteristics, and one of vast importance, as affording a large means of sustenance to the human race in all parts of the world. The pig is a perfect cosmopolite, adapting itself to almost every climate, increasing rapidly, easily susceptible of improvement, and quickly reaching maturity.

## Zoology places swine as under :

Division	...	...	Vertebrata
Class	...	...	Mammalia
Order	...	...	Pachydermata
Genus	...	...	Sua, or suide
Species	...	...	Sus domestica, or domestic fowl.

The hog has fourteen molar teeth in each jaw; six incisors, and two canines, curved upwards, and commonly called "tushes."

Swine do not ruminates or re-chew the food, and belong to an order called "pachydermata," or thick-skinned animals, which includes the elephant, rhinoceros, hippopotamus, &c.

The *sus* family, or *suide*, comprehends, under the latter generic term, several animals, as the peccary, babirissa, the phaco, chaene, and the capibara, which resemble the hog, pig, or *sus* of common understanding. These animals are exotics, and the pig only is known in Europe. The feet are cloven, and have two toes behind that scarcely touch the ground; the incisor teeth variable in number—the lower incisors projected forwards, the canines projected from the mouth, and recurved upwards; the muzzle terminated by a truncated snout, strongly fitted for turning up the earth; the stomach but little divided; body square and thick, more or less covered with bristles and hairs; neck strong and muscular; legs short and thick. All this species feed on plants, and especially on roots, which the snout enables them to grub from the earth; they will devour animal substances, but scarcely hunt or destroy animals for the purpose of devouring them. They are thick-skinned, obtuse in most faculties, except in smell and hearing, voracious, bold in defence, and delight in retired, shady, and humid places. The animal is generally regarded as stupid, brutal, rapacious and filthy, intractable, obstinate, dull, and unwieldy—low in the scale of organization, but highly useful to the purposes of man. The natural age varies from 15 to 30 years; but the improved purposes seldom allow an age beyond two years. Geological research finds the fossil remains of swine included in the quadrupedal era of the globe among the diluvial deposits that contain the horse and ox and the other mammals of the vertebrate division of animals. In point of antiquity the pig fails only in the records of the early patriarchal ages, where the notice falls below the mention of the horse and the ox. The diminutive size being unfitted for draught might not attract so much attention as the larger animals; and the aversion or prejudice so early entertained to its filthy habits might continue the neglect of this species of animals.

All the breeds of swine have been obtained by the effects of external influences, and of the selected propagation from the genus of animals called *sus* (or hog), the species *sus aper* (or wild boar), and the variety *sus domesticus* (or the tame swine). No animal is more sensible of the effects of soil and climate, and none has yielded a more varied progeny from the same original stock. The common origin is easily discovered, as the natural instinct of the animal never in any case forsakes it.

The pig or sow is reckoned a filthy animal—heavy, dull, and stupid, and low in the scale of organization; the bulk is unwieldy, and the general appearance unhandsome. Though this character may be true, the redeeming qualities are many, and sufficient to overbalance the estimate of disadvantages.

The animal is multiparous, and produces a numerous offspring, that are healthy and strong, and easily reared into maturity. The accommodation required is simple and not costly; the food is various, and not restricted to any quality; the flesh is more generally useful than that of any other animal, being palatable and nutritious in the fresh condition; and, as it is easily cured by taking the salt better than any other animal flesh, the use is very large among the working population, for naval stores, and among the articles of maritime states. The skin and the bristly hairs are made into saddles, coverings of books, and into brushes, and into the pointed ends of shoemakers' threads; and the bones are crushed into manure. No animal is more useful to the purposes of man, and none is so readily adapted in the forms and qualities to suit the varied affections of the globe.

Every variety of swine inherits the prolific quality which produces a numerous offspring that is most abundant in the half wild or unimproved kinds of the animal. The first litter is less numerous than the following births, which succeed each other as rapidly as natural faculties will allow. The number

of young is large, and the animal is provided with an ample milk vessel and many teats, in order to accommodate the suckling progeny. This property imparts a very considerable value to the pig, as useful animals of the farm, the number compensates for the want of bulk, and the comparative little trouble encourages the domestic utility of the animals. The young are soon weaned into maturity, the growth is quick, and the delicacy is less exposed to accident than in any other quadrupeds that are bred and used on the farm. Pigs are in every respect much less costly than the other fattened produce of the farm, with the exception of poultry, which are wholly different in the nature and arrangements. The very destructive habits of swine render necessary a strict confinement of the animals; but the seclusion is less individual than of the other quadrupeds, and the attention required is not so great. Hence arises the minor consideration that has been almost universally bestowed on swine, till the evidence that the comparative value has compelled a notice of some corresponding degree.

The pig may not be indigenous to the British Isles; but the animal was noticed by the earliest writers as a wild beast of the chase, of which the extinction is uncertain in point of date. The pig had been domesticated when records began to be made of agriculture, and is described as a useful animal of the farm. The best lowland hogs were large in bone, long in the limbs, low in the shoulders, and narrow and curved in the back, uniting every objectionable point, and totally devoid of any approach to symmetry. The shape was most uncouth, and the face almost wholly hidden by the long slouching pendulous ears. The animals consumed much food, and fattened slowly; but the prolific quality produced a numerous progeny, which were nursed with a profusion of milk. Many varieties of this general and sole description of swine had appeared in the descent from the wild hog, as each locality of soil and climate had formed to itself a breed which bore the permanent marks of external impressions. Domestication multiplies any species of animals into many varieties, after it has obtained a full and complete influence. Variety in the feeding and management, the selections of particular forms for the purpose of breeding, in order to gratify fancy or caprice, and the crossing with other and sufficiently allied stock, are the chief circumstances that concur in producing the many differences of domesticated animal life. The larger quantity of food in the tame condition induces many changes in the animal frame, the eagerness for food is increased, and the tendency is developed to the secretion of fat, and of general obesity. The habits are changed from nocturnal prowling into feeding by day—the desire of liberty ceases—the body is enlarged and distended laterally—the ears not being required to catch distant sounds, as in the wild condition, decrease in size, and become less movable; the tusks of the male, no longer needed for self defence, vanish from sight; the muscles of the neck are much relaxed, and are less developed, and the head is seen to be more prone, or looking downwards; the limbs become shorter, less muscular, and less suited for active motion. Along with the form of their bodies, their whole habits and instincts are completely changed. The very wild fierceness is lost, though a degree of voracity remains: the animal never again becomes the wild hog after domestication. A new condition produces a new set of creatures; the natural quality of great propensity to devour food, to enlarge the carcase, and to secrete fat, operates most powerfully, and wholly changes the original production.

The changes which thus occur in the form and character of the animal, from the alterations of the condition in which he is placed, are not of a superficial or evanescent kind. The degree is so great as to become strictly permanent; the impressions are so lasting as to distinguish breeds and varieties: and if the term "species" was applied to indicate the differences of form alone, the domesticated hog would be said to be specifically distinct from the wild one. The number of teeth varies with the external agents which affect the animals, from six incisors in the wild state to three in the tame condition, both in the upper and under jaw. In no other animals does this effect happen, the number of teeth being constant in every condition. The tail almost disappears in several varieties of domesticated swine, and the vertebrae differ very much in number.

The changes that have been mentioned reduce the hog into many breeds and varieties after the characters have assumed a certain degree of permanence, and no domestic animal so easily receives the impressions that are wished to be affixed. This

quality is very much facilitated by the rapid powers of increase, and the constancy of characters which are transmitted to the progeny. No animals are so easily improved by breeding, and so quickly rendered suitable to the required purposes. As with cattle and sheep, the same marks of external form indicate the early maturity and the propensity to fatten. The body is large in proportion to the limbs, or the legs are short in proportion to the body; the chest is broad, the trunk round, and the extremities are not clogged with coarseness. These essential points always indicate an early maturity and a fattened condition, with less expense of food than when a different conformation is possessed. The entire general appearance of the domestic hog indicates a strong tendency to fatten and to accumulate flesh.

When the great improvements in agriculture commenced in Britain about a century ago, pigs were observed among other articles of the farm, and the alteration was entertained to be done by the same rules as in the case of the other domesticated quadrupeds. By this period of time the changes that have been mentioned had silently and gradually produced many local varieties of swine from the original domestication of the wild hog, some possessing very good qualities, others only middling, and many were still very deficient. When the eye of observation looked abroad in quest of materials with which to amalgamate the best existing properties of swine, an ample store was found for selection, and of very similar analogies that could be easily blended. Skill and judgment were applied to the consorting of similar and not very distant properties, which being persistently continued, a new race was produced, which was stamped with the better qualities by the regular propagation. The accidental productions of Nature, which exhibit superior properties, are many in swine, from the very abundant progeny, and consequently a larger field of quicker action afforded than with other animals, where progeny is less frequent and numerous, affording fewer opportunities of selection and continuation. The inferior grade of importance that has ever been attached to pigs, attributed less notice to the animal than to the other quadrupeds; fewer minds were occupied with the business of improvement, and the results were not so much regarded. Chance and accident had, as usual, a chief sway in the management, and ended in the stray productions of a capricious and neglected direction. Accidental productions were used as chance found or fancy made the application. Changes were done without being directed, and good properties were obtained without the wish or intention. In this way, improvement progressed, and materials were provided for the future advancement.

It was soon perceived that certain forms of pigs attained an earlier maturity, and fattened more rapidly than others of a different shape; and that a certain quantity of food had a greater effect, in the way of maintenance, with the animals that possessed the former properties. Judgment selected these animals for the purpose of propagation, with the view of obtaining a perpetuity of properties that were seen to be so valuable. The frequent and numerous progeny of the pigs very quickly and amply showed if the practice adopted was correct, and if the desired properties were continued in the wide and general developments, if the inferior qualities of the more numerous progeny were relinquished, and the good properties retained of the fewer number that had been selected to propagate. The very great adaptation of swine to circumstances had been observed and meditated, which is beyond almost any other animal of domestication.

During the progress of improving the swine of Britain, much advantage was derived from the foreign breeds of Naples and China, which countries had secured a variety that possessed several points of excellence, as the delicacy of flesh was produced in warm countries. Coarseness of form was the great fault of the native swine of England, and the consequent aptitude to arrive at an early maturity of flesh and fatness. The mixture of the Asiatic blood has everywhere tended to correct this defect, it has much lessened the size, and probably the power of producing a numerous progeny. The flesh of the Eastern hog is particularly tender and fine in the grain; but it is suited for the small and fresh pork of the table, rather than for bacon. The quality of the flesh is very readily transmitted to the posterity, and this faculty strongly recommended the use of the swine in Britain. The native pig of China is delicate, and very sensible of cold—the value lies in the intermixture with more hardy races, which

has been attended with most beneficial results. The form of the Chinese pig is not handsome: the body is long and trailing, back sunk and bending downwards, and the hams thin. The delicacy of the flesh is the chief and almost only excellence; with the very prolific nature in producing young, both numerous and frequent.

The pig of Naples is black in colour, and without bristles—but which grow in this country—the leg of medium length, the body square and cylindrical, exhibiting a symmetry much beyond any other variety of swine yet found in a semi-reformed condition. The flesh is very good in quality; but the animals are not hardy, and are little adapted for general use. The crosses with British swine have been very valuable, the progeny showing much fineness of form and aptitude to fatten. Much benefit has ever accrued from the use of the swine of Naples, as it possesses the most valuable adjuncts of bulk and quality.

The continued and progressive improvements in the breeding of swine in Britain have led to the formation of three distinct varieties or kinds of animals—the large kind, the middling sort, and the small size—all of them derived from the same source, and fashioned in the present condition according to the elements used in the propagation, and the maintenance that has been afforded. The fancy of the breeder and the local use of the peculiar articles of consumption, not to omit the powerful influence of chance and accident, have contributed to fix the varieties of swine in the particular places of residence, and the adaptation of the animal organization to the soil and climate have continued the propagation of the kind of swine, with little intrusion, since the time of the settled production of the permanent marks of excellence. Modifications do exist, as in all other matters, either organic or inert. The nature is as extensively varied as in other animal organisations, and the variations are as large as there are influences of producing circumstances. But very evident tendencies are seen to exist, which incline the arrangement of the animals in some one of the three distinctions that have been mentioned—a majority of qualities, of which the bulk is the chief mark, is sufficient to indicate the degree of position in the kind of swine, and to fix the standard of its merit. Though every point of improved excellence is not present, the prevailing appearances never fail to exhibit the relation which is possessed by the animals, and also the scale of merit that has been reached. In reaching the highest perfection as yet attained, very many intermediate productions have appeared which support a very valuable character, and occupy a position the most profitable for general use. All minor grades that have been somewhat elevated by the higher improvements are very widely spread, and form the most numerous class of swine in Britain, following in the wake of advancement.

The large improved breed of swine has been produced by propagating from the best specimens of the old English hog, by persevering in the judicious selection, and most powerfully assisted by the altered circumstances of maintenance and domesticated accommodation. Confinement in sheltered abodes, along with an ample supply of food, changed from the scanty gatherings of the forest and the field into prepared meals from grains and roots, very soon effected great startling changes in the whole conformation of the body of the hog. The narrow erectness of the back was depressed into nearly a level extent from the head to the tail; the ribs were much curved outwards, and largely increased the lateral extension of the carcass; the snout was shortened, and the long pendulous ears were very much reduced in size. The widening of the body brought it nearer to the ground, shortening the legs, and expanding the frame. Domestication has produced effects on the organization of swine almost beyond any other animals that are used for the purposes of man, in the size, form, and colour. The variations are numerous and very different. The visible marks of the parent source still remain in the large swine of England. The colour is mostly white, passing into black through many gradations of varied colours. The size is also of different bulks, the carcass very clearly evincing to what designation the animal belongs among the breeders of swine. The modifications of the breed are not many, as a reduced size quickly passes into the middling variety, and an enlarged bulk still retains the stamp of the large breed. The station is very clearly occupied, and most easily discerned.

The large hog of the present day exhibits an animal carcass

of very considerable symmetry, allowing for the natural unwieldy bulk of the pig, and the inelegant form. The back is still rounded, and the sides flat; the head is depressed, and the ears slouch forward. The length of carcass suits the purpose of large salted meat, and the width of body adapts the flesh for salted hams of large size. The depth of rib adds to the value of the carcass, as it favours the width of the flitches of bacon. As in large bulks of every kind, the symmetry is inferior to smaller forms, and the quality of the flesh is less delicate, and not so agreeably-tasted.

The sows of the large breed are very prolific in bearing young, and suckle them well with an abundance of milk. These two very valuable properties have been transmitted from the primeval source, and are inherited by the progeny in a degree beyond all other breeds of improved swine in Britain. Other deficiencies are very much compensated by these two qualities, which are banished by the very extended refinement of the organization, but which may be retained in a fair degree in the improvement of animals of every kind.

The best specimens of the large breed occur in the secondary bulks of carcass, which show the utmost symmetry of that variety of pigs. The rounded back, depending belly, and flatness of rib bear ample testimony of the descent from the old English hog; while the small head, full cheek, width of ham, and shortness of leg and ears very strongly attest the large improvement that has been made from the uncouth source of production. The huge bulk overpowers the strength of leg, and prevents the due exercise for the proper discharge of the animal functions, and the consistence of the flesh, which, however, only happens with the very largest sorts. The quantity of inside offal is large, but not disproportioned to the bulk of carcass, while the exterior offals are not larger than in other improved breeds of swine. The proportion of meat to the bulk of carcass is probably superior to most varieties of swine; the bone is small in a very fair degree, and refined as far as seems to be just and proper.

The large breed of pigs, in the most bulky carcasses, is confined in comparatively few possessions, and rather diminishes in public estimation. The breed recedes before the middling-sized swine of the next description of which the largest sort mingles, and is much confounded with the smallest variety of the heavy breed. The largest purposes of hams and bacon are suited from the most bulky carcasses of the middling breed, which very much encroaches on the large variety, and curtails the peculiar utility. Bacon and hams of the largest size are the only valued productions of the heaviest breed of swine: the use is more in the small pork of delicate flesh in the young or half-grown condition. The general preference entertains a number of carcasses rather than very heavy weights, and delights in smaller forms of compact shape and neat symmetry. When these properties are attended with the purposes of the heaviest bulk, which has now happened in the largest sort of the middling swine, the advantage does not appear of pushing the growth into a very huge bulk of animal carcass, and somewhat smaller bulk answers the purpose, and only requires to be enlarged in the number of individuals.

The middling sized breed of swine is the most extensively used variety, and justly esteemed on the most incontestable grounds of preference. The sort of pigs has been obtained from crossing the best shaped medium bulks of the improved English hog with the Neapolitan boar—the very remarkable lateral extension of the carcass has been got from the foreign animal, with the shortness of leg and delicacy of flesh. The colour of this variety is white when the old English hog has had most influence in the production, and black when the Neapolitan blood has been more employed. The black pigs exhibited a greater likeness to the foreign animal than the white kind, which confirms the above observation that the blood has been more largely employed. The hair or bristles are more wanting in the black, and more abundant in the white variety, which further shows the former to be more Neapolitan and the latter more English in the descent. The truth is quite evident from looking at the different animals. Both colours rank as middle-sized swine, however the pigs may be bred; if the sources of descent be different, the continued propagation has ended in the same result of producing and fixing a variety of swine that remains yet altogether unequalled.

The breed of middle-sized pigs possess the unequalled advantage of affording in the young condition the delicate article of sucking pigs, and of fresh pork in the maturity of young growth. The most advanced fattened age yields hams and bacon of a sufficient size, which excludes the use of the large breed of swine that has been described. The flesh is much more delicate of the present breed than of the last-mentioned; a greater number of the animals can be kept on the same quantity of food, and the fattening process is more quickly finished. The prolific quality is very fair, and sufficient to maintain an ample propagation; a limited number of healthy young is preferable to a numerous unhealthy offspring. The milking property is also very sufficient for the nurture of the offspring; no hurtful disproportion attaches in any way to the variety of pigs, and a greater use attends the breed than is found in any other British swine. The animals are found all over Britain, in various colours and proportions; the size is the mark of discrimination, whatever may be the colour, particular shape, or supposed pedigree. Very many localities have forged a breed of this denomination of its own name, which all sink into one general character as now distinguished.

In this most useful of all the varieties of British swine, the body is of rather long dimensions, straight, and looking square from every point of view. The back level and wide, with a great lateral extension of ribs, which are full, and not flat, with a straight belly from the hind udder to beyond the fore teats, and touching the fore legs. The head of a medium size, ears more than half erect, and tapering, snout short, eyes not too deeply sunk, cheeks full, and shoulders wide. Legs of medium length, and strong to support the carcass; tail of medium thickness, and once twisted; hams deep, wide, and covering well to the knee; outside of the hams not quite flat, nor protuberant, but upholding the level line of the sides of the carcass.

*(To be continued.)*

## FATTENING ANIMALS IN A HURRY.

We have pointed out in former years the futility of attempts to lay heavy masses of flesh on poor cattle by stuffing them with rich food. Such attempts not only prove to be failures, but are always wasteful. The material consumed is nearly lost, the animals remain comparatively poor, and the owners are convinced that fattening animals for market "don't pay."

It is perhaps well for the cause of good management that all neglected treatment of animals should result in loss to the owner. If he has starved his cattle, sheep, and pigs for a year or more, he cannot atone for it by sudden attempts to push them to fatness. On the contrary, the only true way is to see that growth continues without cessation, summer and winter, from the earliest period of their existence till they are finally sold in market. A single check given to this continued progress may arrest or retard it for months. Our own observations lead us to the opinion that the whole profits resulting from

raising and fattening, when this continued progress is kept up by careful, regular, but not extravagant feeding, are at least triple the amount realized from early neglect and heavy feeding afterwards—and often the difference is many times greater than here stated.

There is nothing that should be more strongly impressed on the mind of the young farmer who makes the feeding of animals a prominent part of his business, than the importance of keeping up an unremitting growth throughout the whole course of their existence. The most successful pork-raiser, with whom we are acquainted, adheres strictly to this course: not only feeding his store pigs well and regularly through fall and winter, but commencing the fattening not merely in autumn, as is too commonly the case, but *early in the spring*.

It is objected that this management is too expensive. This objection is urged by those who find two or three months only



to consume more than they can afford. They feed heavily for a short time, but do not receive a corresponding return of increased flesh. "If two months' feeding," they inquire, "costs us so much money, how can we ever afford to continue it for two or three years?" It is very true they cannot, because the whole system they adopt is a profitless one. Fortunately it does not require heavy feeding to keep up the continued growing condition of animals. Here is a great error into which many have fallen, which we have endeavoured to correct. John Johnson made the remark some years ago that the copious feeding of grain or meal to cattle is no better than a moderate amount. We gave the statement some years ago of experiments performed by G. H. Chase, of Cayuga, who carefully weighed every week all his fattening animals. A daily supply of four quarts of barley meal to a fine steer gave a weekly increase in weight averaging eighteen pounds. A neighbour advised him to *push* him, and eight quarts were accordingly fed daily. The weekly increase of flesh was less than when he received four quarts. The amount being increased to twelve quarts per day, he gained nothing at all. Several similar instances have come to our knowledge, and among others a fine animal was recently fed by a neighbour a

peck or more of rich meal per day. After thus urging on the fattening process, as he supposed, for several weeks, he was finally sold, and proved to be only a few pounds heavier than when purchased. The many bushels of feed which he had consumed, and the labour of attendance given him, literally went for nothing.

Successful feeders, who prove all their experiments by weighing, have long since ascertained that animals in fine condition will lay on more flesh for the amount of food eaten than those of inferior character. Hence shrewd men will not purchase lean and raw-boned animals for fattening. This fact serves to establish the truth that all animals at all stages of growth should be kept fleshy. It need be scarcely necessary to remind any intelligent manager that the difference between attending to all the comforts of an animal by cleanliness, good wholesome food given regularly and in moderate quantity, and neglecting all these particulars, is simply the difference between those in fine healthy condition and such as are feeble and raw-boned. It may be laid down as true, with scarcely an exception, that the farmer who carries on the business of fattening at a loss, is one who neglects at one time and over-feeds at another.—*Country Gentleman (American)*.

## THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

### PUBLIC MEETING IN LEICESTER.

On Monday, Oct. 16, a public meeting was held in the Castle, to consider the propriety of inviting the Royal Agricultural Society to hold its meeting, in 1887, in this town; to open a subscription list; and take such other measures for the promotion of that object as might be deemed expedient. The attendance was very limited. Among those present were Lord Berners, Sir F. Fowke, Sir W. de Capell Brooke, Mr. C. W. Packe, M.P., Alfred Burgess, Esq. (mayor), Mr. W. Miles, Alderman S. Viccars, J. Underwood, E. S. Ellis, Councillors C. Harding, J. Shenton, J. Sarson, R. Angrave, and J. Crow, Messrs. T. Burgess (Wigston), W. Chamberlain (Deaford), T. Willson (Knaptot), and Revds. H. J. Hoskyns, E. Elmhirst, and others.

On the motion of Mr. Packe, Lord Berners was unanimously elected to the chair, and the following resolutions were passed:

Mr. C. W. PACKE, M.P., proposed: "That this meeting having heard with much satisfaction that the Royal Agricultural Society of England intend to hold their annual exhibition, in the year 1887, in one of the midland counties, it is hereby resolved that a deputation from the town and county of Leicester do wait in due course upon the council of that society, and request them to select Leicester for that purpose; and, in the event of their so doing, that this meeting pledges itself to use its best endeavours to give the society a hearty welcome."

The MAYOR seconded the resolution, and it was carried unanimously.

Rev. E. ELMHIRST proposed: "The corporation of Leicester having offered to the society that most eligible spot, the Race-course, this meeting recommends the local societies to forego their cattle shows, in case the Royal Society visits Leicester, and urges upon the committees of such societies the necessity of appropriating their funds, in the year 1887, in aid of the sums required by the Royal Agricultural Society."

Alderman E. S. ELLIS seconded the resolution, which was carried unanimously.

Mr. G. NORMAN proposed: "That a subscription list be at once opened at the various banks in the town and county, for the purpose of providing funds to meet the conditions of the Royal Agricultural Society."

Mr. Alderman HARRIS seconded the resolution, which was carried unanimously.

Major FREEB moved: "That the gentlemen form a committee, with power to add to their number, for the purpose of carrying out the foregoing resolutions, as well as to act as a deputation to the council of the Royal Agricultural Society,

and to take such further steps as they may deem necessary for the foregoing object."

Mr. S. VICCARs briefly seconded the resolution, which was carried unanimously.

Sir F. T. FOWKE proposed that the best thanks of the meeting be given to the high sheriff of the county; also to his lordship, for his able conduct in the chair.

Mr. W. MILES seconded the resolution, and it was carried unanimously.

His lordship and the mayor having acknowledged the compliment, the proceedings terminated.

WHERE FAT AND FLESH COME FROM.—They come from the earth and the atmosphere, collected by vegetation. Grass contains flesh; so grain. The animal system puts it on from these. Vegetation then is the medium through which the animal world exists; it can exist in no other way. When grass or grain is eaten, the flesh constituents are retained in the system; so also the fatty substance, that is the starch and sugar, from which fat is made. Some grains have more flesh than others; so of the qualities that make fat. In a hundred parts of wheat, according to Piesse, are ten pounds of flesh; in a hundred parts of oatmeal nearly double that amount. Hence oats are better for horses, on account of their flesh-forming principle, rather than fat, as muscle is what a horse wants. For fattening purposes, however, corn and other grains are better. When flesh itself is eaten, the system but appropriates what is already formed, but would as readily take it from vegetables, from flour. The flesh-making principle—or the flesh itself, in its constituents—goes to form cheese in the dairy; the starch, &c., butter. Hence it is that some people assert that cream has little influence in cheese, farther than to enrich it; for cheese and butter are entirely distinct. The same kind of food is equally good for the production of either. This is a point of considerable interest, and is not yet fully explained—indeed, it is yet in its infancy. And a plant in its different stages of growth has a different effect. The fat of the plant is held in reserve for the seed; nothing is wasted in leaves, wood, &c.; the precious seed must have it. Hence, when this takes place, the stalk is comparatively worthless to what it is prior to the change. And the fat cannot be appropriated so well in the seed as when it is diffused through the stalk. Tender herbage, therefore, is the best; and when secured before the direction of the oil takes place, so much the better will be the hay.—*Rural World*.

## MECHANICAL BRICK AND TILE MANUFACTURE.

According to the oft-told story, the manufacture of brick is nearly coeval with the industry of the human race. The question has even been raised as to whether the ancient Chaldeans, Egyptians, Greeks, and Romans were not better acquainted with the art in their time, than are the inhabitants of Western Europe at the present day? That they (the former) had attained to a very high proficiency in the art is manifest, for the buildings which they have left testify this to modern times. That we have many advantages over them in a mechanical sense is unquestionably true; but when the quality of the bricks and tiles of the two periods are placed in the scale, this shows the balance in their favour rather than the contrary; so that a practical question naturally arises for solution, viz., have we profited as we might or should have done by our superior machinery? or have we allowed ourselves to fall behind both in this and also in other respects?

A better style of agricultural buildings is much needed, and also brick-walls for fences, &c., and this in many localities involves cheaper and more durable bricks than are now made; and these two conditions, cheapness and durability, on the other hand, embrace all the most improved mechanical appliances that can be brought to bear upon their manufacture in the brick-field, and also the best method of burning, together with the best quality of clays, &c. The subject thus divides itself into two practical problems, the one mechanical, and the other chemical. In this paper we shall confine our observations to the former—the mechanical question of tile and brick manufacture.

Much of the machinery that is now generally used in the manufacture of bricks is of the simplest character, the working apparatus and stock, upon perhaps the majority of brick-fields, being of the rudest mechanism, the whole bearing a close resemblance in many respects to what was in use in ancient times. For the most part, the inventory consists of a pug-mill, an old horse and harness, a hut, moulds, and making-table, with a few barrows and hand-tools; everything in the list being of the most primitive construction possible, the clay in some cases being kneaded by the treading of cattle instead of pugging. And yet from some of these old-fashioned brick-yards the very best quality of bricks is produced. Where roof and drain-tiles are manufactured, a tile machine and drying-sheds have to be added to the inventory; and when the bricks and tiles are delivered by the manufacturer, horses and carts are also necessary.

The fact that such simple machinery continues to be used so largely, and even preferred by many intelligent manufacturers, who have the command of ample means to get more complicated articles, is highly instructive in more respects than one. In the first place, for example, it leads the inquiring mind backwards retrospectively to the practices of the ancient Romans, Greeks, Hebrews, Egyptians, Sidonians, Babylonians, and Assyrians of oriental times, and the best quality of burned or baked bricks, which they made with machinery of a still more primitive character than that in question. In the second place, the attention is directed to the investigation of the principles upon which such simple machinery, ancient and modern, is constructed, in contrast with the more complicated and expensive machinery now being brought into the brick-field. In the third place, the question naturally arises as to whether in prosecuting the mechanical question we have not hitherto been losing sight of the chemical one. And lastly, ought not the mechanical question to be made more subservient to the chemical question during the future than has hitherto been done during the past?

The second and last of these questions are those which chiefly belong to our present paper; and, besides, they are the more interesting of the four, for other reasons. Sound principles are always cardinal questions in the construction and use of machinery; and when the intrinsic and practical value of that machinery is dependent not upon one, but upon a series of chemical demands being faithfully complied with, the ultimatum need not be told; for the fulfilment of the latter—the chemical conditions—embodies, as it were, the former—the principles in question. Hence the practical conclusion,

The modern machines, that stand in contrast with the ancient, whose principles of mechanism we have to examine, are pug mills, washing mills, grinding mills, moulding mills, alias brick-and-tile machines, and compressing machines. Frequently the first and third are combined together, so as to form one machine, and with these two the fourth and fifth are also sometimes connected, so that the grinding, pugging, moulding, and compressing of the clay are performed at one and the same operation and time. In other cases the bricks are not compressed in the process of moulding, but separately, in a different machine.

In Oriental times the grinding, washing, and pugging were performed, for the most part, by the feet of slaves, captives, and cattle; and as the practice of treading the clay has come down to our own times, the contrast is simple, and the conclusion is easily drawn, for the best quality of the bricks in both cases decides the matter, and in very many cases, if not the majority, the decision is in favour of the old practice. Again, in hand-moulding, the moulder always, less or more, compresses the tempered clay into the mould, so that the practical question naturally arises for solution, Did the Chaldean and Egyptian "task-masters," in the brick-fields of Assyria, Babylonia, and Egypt, pay more attention to this peculiar manipulation of the art, than our moulders do in modern times? And the closeness of the grain and toughness or cohesion of the bricks in both cases evidently points to an affirmative answer in favour of Oriental art in this division of the work also, as in the previous one—the preparation of the clay for moulding.

Of course, the questions being practical ones, both the above conclusions must be received with a considerable degree of qualification. In the latter division of the work, for example, the ancient brick-makers may have paid more attention to the selection of a finer quality of clay, and to other chemical considerations involved in the mixing and seasoning or tempering of that clay, and in the burning or baking of the bricks, that are sufficient to account for the difference in the closeness of the grain and strength of the bricks being in their favour; and these again must furnish a similar key to the practical solution of the first division of the work, viz., the preparation of the clay for moulding.

It must be admitted, however, that our modern methods of pugging, grinding, washing, and machine-moulding are defective in many respects. In other words, our pugging, grinding, washing, and moulding mills are not constructed on sound mechanical principles, inasmuch as those principles do not harmonise with or respond to the peculiar demands of the chemistry of brick manufacture. A passable exterior at little money out of the readiest materials at command appears to be the watchword of the modern practice, rather than a fine grained, strong, durable brick; whereas the reverse of this maxim was evidently the oriental rule, in the case of the best quality of baked bricks. No doubt the ancients had inferior bricks also, viz., sun-dried bricks, which have long ago crumbled into dust, the best quality only having stood the test of time. This must be granted, but the set-off does not elucidate the object of the contrast under investigation, which is simply the points of superiority of the ancient practice, and the experimental lessons which those points teach for the information and improvement of the modern artist. True enough, we want a cheap brick, but inferior quality is invariably dear at any price; it follows, therefore, that quality must never be sacrificed to little money, or cheapness in the ordinary sense of the word; and this sacrifice is, we are apprehensive, being too often made, both as to the quality of the brick and the construction of machinery for its manufacture.

Confining our observations to the mechanical question, it will be necessary to go somewhat more closely into the details of mechanism both of the machinery and of the articles they produce, in order to show the soundness of the above conclusion relative to the sacrifices at issue.

The first inquiry which we shall enter upon has for its object the improvement of our pug-mills and washing-mills, by

showing wherein their details of mechanism are defective in principle. Thus the action of the arms of pug-mills and washing-mills, owing to their radiating from a revolving shaft, is greater towards their extremities than near the shaft or axle upon which they are fixed; consequently the clay is not uniformly acted upon and worked throughout. True, the arms of the former (the pugmill) may radiate tangentially, and be otherwise curved, so as to turn over and throw the clay from the centre towards the circumference of the barrel in which they work. But is not this sacrificing a second principle of mechanism, in order to atone for the first departure from sound principle?—a deceiving of ourselves, as it were, by having recourse to a system of special pleading to serve the commercial purpose of the moment in place of a better? For if the eye of the observer could only see what was going on within, the probability is that the old horse would have to turn tail and move in the opposite direction, owing to the greater velocity of the outer portion of the arms and the reaction of the clay upon the inner surface of the barrel. No doubt the proposition of turning the clay inwards towards the axle is nearly as objectionable as that of turning it outwards; but this is only a very good reason why both should be more closely examined from a practical point of view, and if need be, supplanted by less objectionable processes—processes embracing uniform velocity and action through the materials acted upon.

Again, with regard to washing and grinding mills actuated on the rotary principle, similar objections may be raised against them, owing to the cycloidal and central action of the working parts, and the unequal results which must consequently be produced upon the clay. And besides the mechanical objections of this kind, we shall also find that chemical objections may also be raised to both processes, washing and grinding, as now commonly performed.

In the ancient and still-common practice, the action of the implements and feet of men and cattle in working the clay was and is performed on the reciprocating rectilinear principle, and not on the rotary principle. The contrast, therefore, between the two is very remarkable, the economy and uniformity of motive power and effect produced being evidently in favour of the former, the old "to-and-fro"-working machines of the ancient brickmakers, who were well versed in mechanical science as applied to architecture. And the peculiarity in favour of the old-fashioned machines is, that the force applied is on the principle of percussion, the stroke in the case of the tramping of the feet of men and cattle, and the working of the "mortar bar" (a long, bent lever, or bar of iron) by hand, being downwards, while that of the "mortar drag," or rake, was to and fro horizontally, the effect produced in both cases being far greater than the rotary stirring process, where the action of every point in the arms of the pug-mill is uniform, although the actions of the different points are different from each other, the velocity and force of the stroke being directly as the distance from the axle or shaft upon which the arms are fixed.

Of these two different principles, the latter (percussive force), and the effect produced by it in the working of the clay, is perhaps the more important and deserving of attention by those of our readers interested in the improvement of pug-mills and moulding mills, as it is a well-established and familiar fact that no amount of slow, uniform stirring of clay or like material, or pressure, will compensate for a sharp stroke of the "mortar bar," back of the labourer's spade, or bricklayer's trowel. Even in the process of hand-moulding the clay, there is a certain amount of percussive action in the illing of the mould that is essentially necessary to good workmanship. In all these operations the temperer or worker of the clay, the brick-moulder, bricklayers' labourer, and bricklayer are familiar with the peculiar percussive stroke of their respective manipulations, and how much their success depends upon its proper performance. But we have not yet begun to each our pug-mills and moulding mills how best to imitate his peculiar percussive action; the contrary—how best *not* to do it—being rather the general rule!

Again, the common method of removing stones, flints, and hells by grating and the like is objectionable, and obviously a departure from sound principles. The grinding of such substances into sand, so as to mix and be incorporated with the clay, is often as far from what the chemical requirements of good brick imperatively demand, the quality of such ground substances being in some cases objectionable, in others the

quantity being in excess, the chemical rule in both cases being their removal.

A few remarks on the mechanical properties of a brick will conclude our present paper. Under this head, bricks, both ancient and modern, may be divided into three qualities, apart from the ordinary division of English bricks into place bricks, stocks, facing and cutting bricks, &c.—*i. e.*, each kind may be further subdivided into three qualities of good, medium, and inferior. And this division also applies to machine-compressed bricks, to perforated bricks, machine-moulded bricks, and hand-moulded bricks. In short, it has reference to the fineness of the grain, and uniform solidity and moistness of the brick, including its cohesive and friable properties. The reader will thus perceive that, instead of a concluding paragraph, it would require a long article to do justice to this division of our subject. All, therefore, that we shall attempt at present is, merely to take a passing glance at its several heads.

Not the least important of these is a proper degree of uniform moistness; for unless this is attained, the brick will change its form in the drying and burning. And we may further observe, the question is of more importance than is generally imagined. The next thing is uniformity of grain. The grain may not be very fine; but if uniform, the brick may prove strong and durable. On the other hand, small stones or grit of any kind, lamina of sand, vegetable mould, or other improper substances will turn out an inferior article. Then we have uniform density—a quality difficult to be obtained in machine moulding, and even in hand moulding; and, lastly, perforated bricks and compressed bricks—the last the best, the clay being right in other respects.

## ON AGRICULTURAL FIRES AND INSURANCE.

The following rules and precautions may be useful to some of our readers:—

1. Have your stack-yard situated near a pond, or as good a supply of water as possible.
2. Place your stacks as much as possible in *single line*, and as far from each other as you conveniently can.
3. Put a hay-rick now and then between the corn-ricks. These will keep in *check* any fire if properly attended to.
4. When you use the steam thrashing-machine have your stack-yard well cleaned up by removing all loose straw and litter. Have the machine placed on the *leeward* side of the stack-yard, so that the wind may blow the sparks *away* from it. Let the engine be as distant from the machine as the strap will allow. Have three or four buckets of water handy, and keep the pan of the engine constantly filled with water. Have the straw rapidly removed from the neighbourhood of the engine.
5. Forbid your men, upon pain of instant dismissal, to use lucifer matches or to smoke in or near the stack-yard. Keep all lucifer matches out of the reach of children; this is a frequent cause of accident.
6. If a fire has broken out, having despatched a trusty man to bring the nearest engines, depend upon the exertions of yourself and men. Do not allow the stack to be disturbed—let it burn itself out; but let every exertion be made to *press it together*, and as far as practicable to prevent any lighted particles flying about. If water be at hand, use it of course freely. Protect the adjoining stacks with soaked sacks, rick cloths, tarpaulins, &c. When the engines arrive, let them see after the coverings of the other stacks in the first instance rather than the stack on fire. If the stacks are separated from each other as before recommended, and there exists no danger to the other stacks, of course it becomes desirable to save as much of the one on fire as possible. This is best done by pressing and keeping the stack together rather than by opening it.
7. and last, but not the least precaution—**INSURE YOUR AGRICULTURAL PROPERTY.** The farmer who leaves the contents of his stack-yard to chance now, when the torch of the incendiary is so fearfully destructive, should be written down as either a fool or a madman.

## ROYAL AGRICULTURAL SOCIETY OF IRELAND.

The monthly meeting of the council of the above society was held on Thursday, Oct. 5, in 42, Upper Sackville-street, Dublin, Sir George Hodson, Bart., in the chair.

## THE CLONMEL SHOW.

Captain THORNHILL, Secretary, stated that there was an objection lodged to the prize awarded at the Clonmel show to Mr. Furlong for flax, on the ground that it had not been grown last year. He had received the following letter, enclosing a declaration, from Mr. Furlong:—

"Fermoy Mills, Fermoy, Sept. 23, 1865.

"SIR,—I beg to enclose the required declaration, that the flax I exhibited at the Clonmel Show was grown in the year 1864.

"Was from home when your first letter arrived, or should have done so long before now.

"I am, Sir, obediently yours,

"C. J. FURLONG.

"To J. Badham Thornhill, Esq., Dublin."

Mr. Owen.—That is quite enough.

## ALLEGED CLIPPING OF SHEEP.

The SECRETARY read the accompanying letter from Major Chichester:—

"Runnamoat, County Roscommon,

"September 19, 1865.

"DEAR SIR,—Press of business has prevented my acknowledging earlier the receipt of your favour of 7th instant. I assume that your letter was written under instructions of the council, and I have to request you to be good enough to bring to the notice of that body that in my humble opinion the letter in question does not in any way meet my objection.

"I may remind you that when asked what evidence I had that the sheep objected to had been clipped in a way forbidden by rule 35, I referred you to the sheep themselves.

"My herd might or might not be able to give evidence as to their being clipped on a certain day. In the presence of the sheep themselves his evidence could not have been very material: their testimony was enough.

"Again, I may observe that the answer of the judges, on being applied to, does not materially affect the question either. Their reply 'that none of the sheep exhibited were so clipped as in any way to mislead or interfere with them in their adjudication,' does not affect the point I raise.

"The society makes the rules, not the judges. Those laws, when made, are to be interpreted; certainly not by the judges. It must be the duty of the council to see that the rules of the society are observed, and not the duty of the judges.

"The society declares in rule 35 that when anything has been done that alters the natural appearance of the animals shown, such animals are to be disqualified.

"I called, and do call, the attention of the council to the fact, as I assert the natural appearance of certain sheep shown at Clonmel had been altered, and I call upon the council to enforce the penalty.

"I submit that the council are not in a position to throw any part of the onus of decision on the judges. I state a certain fact, namely, that the sheep objected to at Clonmel, when they were shown in August, had been gone over with the shears since they were shorn in the spring. I state further, as a fact, that such use of the shears does alter the natural appearance of the animal, and I conclude by interpreting rule 35 as being levelled against that and other practices, the necessary result of which is disqualification, none of which practices need necessarily mislead judges or interfere with their adjudication, though it undoubtedly does hoodwink the purchasing public.

"Speaking in all respect, I submit that the council must decide either—

"1st. That the sheep objected to, as stated, were not touched

by the shears since the spring shearing, so far as they can determine; or

"2nd. That being so touched with the shears does not alter the natural appearance of the animal; or

"3rd. That such alteration is not within the scope and meaning of rule 35; or my objection must be acknowledged sound, and must be sustained.

"That wool, if left to itself, will point as it grows, is a simple fact in natural history. That the wool of the sheep objected to at Clonmel did not point is another fact equally certain; therefore, I don't think the council can decide against me on either 1st or 2nd.

"If No. 3 is decided against me, the council must declare that rule 35 does not mean what it says.

"Requesting you to be good enough to lay this letter before the council,

I am, dear sir, yours truly,

"C. RALEIGH CHICHESTER."

Lord JAMES BUTLER said he thought, as far as he could gather from the judges of sheep, they did not think they had been gone over after shearing. Mr. Thurnell's impression was that when the sheep were shorn the weak parts were left longer, to enable them to fill up, but no one said they were subsequently trimmed.

Captain THORNHILL remarked that all they said was that they might have been pointed with the shears.

Lord JAMES BUTLER said the objection was not against that, but against the sheep being manufactured into shape. He gathered from the judges that there had been no clipping, as they were all up to that.

Mr. M'EVoy GARTLAN stated that a slight clipping would not be an infringement of the rule. The judges had already decided that they did not think there was any change in the natural appearance of the animals. If that were so, they could not now go into the matter.

Mr. FOWLER suggested that copies of the letters of the judges should be sent to Major Chichester.

The CHAIRMAN said the gentleman rather disclaimed the authority of the judges. If the rule was clearly interpreted there was nothing done to those animals in a way to alter their natural appearance.

The Secretary was directed to inform Major Chichester that it did not appear to the council that the animals in question were mutilated or tampered with in any way so as to alter their natural appearance.

## THE REARING OF PIGS.

The following letter was received from Mr. Warburton in reference to the rearing of pigs:—

"Kill, Naas, Sept. 2nd, 1865.

"DEAR SIR,—The enclosed letter I cut out of the *Farmers' Gazette* of Saturday last, August 20th, and will feel obliged if you will lay it before the council of the Royal Agricultural Society at their next meeting, as a subject for their most earnest attention and consideration. I know not the writer, but to every word of that letter I subscribe.

"I have for years almost entirely given up exhibiting pigs at the shows of the Royal Dublin Society or the Royal Agricultural Society, because notwithstanding that I have had some of the best Berkshire pigs in the kingdom, and have done them ample justice, I found it impossible to bring them at a given age to the size which other breeders can."

"If the abuse spoken of in the enclosed letter is not amended, the shows of both societies must continue to grow 'smaller and more beautifully less' each year. I trust the council will not consider this a matter for the judges, because judges have no right to doubt the statements of exhibitors.

Yours, faithfully,

"J. B. Thornhill, Esq."

"AUGUSTUS WARBURTON.

Lord JAMES BUTLER said the show of pigs at Clonmel was the best ever held under the society, and contained some of the most beautiful animals that he ever saw.

## IMPROVEMENT OF PERMANENT PASTURE.

Some time since, at the meeting of the Croydon Farmers' Club,

Mr. E. STABLES (of Fickleshole) said: I have undertaken the task you have allotted me with some degree of diffidence and reluctance—not only because of a consciousness of my own inability to do justice to the subject, viz., "The Improvement of Permanent Pasture," but also because I am aware that the subject itself is not the most interesting or attractive to the majority of the members of this Club, and the more so as some remarks I may have to make will be by no means complimentary to many Surrey farmers; but I trust that the motives which actuate me may be appreciated (Hear, hear). I make no pretensions to a scientific knowledge or treatment of the subject; but I propose to make a few practical observations, with the view of provoking discussion, and of bringing out the importance of the subject. The extent of permanent pasture on the Surrey Hills being so very limited, in proportion to the arable land, it is too frequently treated with gross neglect, and not only so, with positive abuse. The plea seems to be that the one or two grass-fields are of so little consequence that they are not worth attention or cultivation, and hence they are simply a convenience to turn the cart-horses out at night, or to keep the milch cow, or for the working sheep to feed in a little during the day-time, when other food runs short, preparatory to being folded on the arable land at night; but the idea of returning any manure is regarded as ridiculous. When I first came into Surrey I was somewhat puzzled with the grass-land; as far as I could understand the general character of the soil, I thought it well adapted for grass, and yet the generality of the grass to be seen was very inferior. Of course I have met with many excellent exceptions to this, which are also very instructive. Having been brought up in a grazing district, and being accustomed to seeing the grass-land farmed, cultivated, and well manured, and profitable crops and nutritious grass grown, I was some time before I could realize the fact that the inferior grass to be seen in this neighbourhood was chiefly attributable to the suicidal manner in which it is treated. I have been so much interested in it that I have made it my business, whenever I have had an opportunity, to inquire, How is the grass-field treated? When was it sown? With what seed? How manured? How stocked, &c.? The more I inquired, the more I was convinced that much of the land on the Surrey Hills is especially adapted for grass; or with such treatment it could not have carried even a goose to the acre. I have every reason to believe that most of the land referred to was never sown down, but laid down as our forefathers a century ago used to do, i. e., to plough and sow the land with cereals without manure, until it would grow no more, and then it was said to be tared, and must be laid down, and so it was left alone to grass itself with such seeds as mother nature might happen to have handy; and, as it is a law of nature that every place shall be occupied with a vegetation suited to it, consequently if there was any strength left in the soil, there was sure to be a pasture of some kind; but, unfortunately, it was not customary to give any manure of any kind to pasture land, and, being so near London, and the price of hay tempting, the poor grass field—poor as it was—was mown year after year, until at last it grew so little that the mowers could not make a mow of it; so after that it was made a convenience on which to turn cart-horses or any other stock. What could be expected from such treatment? That should you expect from arable land treated in that manner? And is it not as proper, and decidedly more profitable, to treat grass land as it is arable land, *liberally*? I think it is, for various reasons. The one great reason which is becoming more and more decided (and irresistible as an argument) every year, is the growing disparity existing between the price of live stock and corn; and, as far as we can understand the causes now in operation, we may expect it to continue and increase. What might have been the price of stichers' meat at the present time if our manufacturing districts had been in prosperity we can only conjecture; but I am quite sure it would have been considerably higher than

it is at present. Then as the extent of our grass land in this neighbourhood is so very limited, is not that an additional reason why it should be made the most of, and why we should cultivate it well, and make two blades grow where only one grew before? That our grass land is capable of great improvement there is no doubt. But as we claim to be professionals, our first duty is to ascertain the cause of the deficiency. Perhaps it is wet: if so, it must be drained, or all other expense will be comparatively wasted. Wonderful effects are produced by even draining wet grass lands. The coarse worthless herbage suited to wet land will disappear, as well as many noxious weeds, and speedily become replaced by herbage of a valuable nutritive kind. In some cases the land may have been sown with inferior kinds of grass, and would be much improved by the application of some good seed. If so, I would recommend the field to be liberally treated with manure, and mowing one year instead of pasturing, and not cut the grass too soon, but to allow it to get well ripe before being cut, by which means the roots of the old grass will be very much thinned, and room made for new seed, which, if previously harrowed, then sown, harrowed again with light harrows, and well rolled immediately the old crop is removed, would be likely materially to improve the character of the herbage. This is a most effectual mode of getting rid of thistles, hard-heads, &c. By one operation you will get rid of 95 per cent., and if you serve it the same the following year it will be a complete cure; but success in this instance depends much upon the previous liberal manuring. But the character of the herbage may be much modified and controlled by the judicious choice and application of artificial manures. If you wish to improve the quality apply a dressing of superphosphate or of Messrs. Hunt's pulverized bones, for several years consecutively, and if you give it a dressing of gypsum in the bargain so much the better; but if you wish for quantity irrespective of quality, I would recommend a mixture of soda and guano, or, as my practice has generally been, to apply a light dressing of superphosphate one year, guano next year, nitrate of soda another year, and so on. I have found this plan to answer very well, although it must be allowed that with the constant removal of stock from ordinary pasture land it must require a corresponding return in the shape of manure of some kind notwithstanding the droppings of the animals. They cannot manufacture all the land grows into manure; they must draw on the land for the manufacture of flesh and bones. Our object should be to return to the land in the shape of manure what we take from it, in the crop, whether the crop be corn, beef, mutton, veal, or any other produce. But as pasture land has the benefit of cattle droppings it evidently does not require the extent of manure as meadow land where the entire crop is removed; yet we must allow that pasture land does require occasional manuring to preserve it in a state of efficiency. The character of the manure required will depend to some extent upon the kind of stock kept upon the land. If young growing cattle or milch cows have been grazed they will have extracted the phosphate contained in the soil. It is estimated that a milch cow carries off at the rate of 30 lbs. of phosphate per annum; hence the propriety of applying bones in some shape or other. There is no doubt that fold-yard manure is the very best general manure; but unfortunately on most arable farms it is too scarce an article, and as our success in farming depends much upon the study and practice of economy, it appears more proper, as a general rule, to apply fold-yard manure where it can be ploughed in, although I do not think, as some people argue, that there is any great waste in the top-dressing with fold-yard manure. I think an occasional top-dressing with dung on meadow land, where the entire crop is mown and removed, may be allowed; but in the case of pasture land which gets the dung of the cattle pastured on it, and only requires a little more help, the propriety of using suitable artificial manures is evident. It is of importance that the droppings of the cattle should be frequently spread, and not allowed to remain just where they happen to fall. This is a very common neglect, by which much valuable manure is wasted or worse than wasted,

as an over-dose is positively injurious. Where horses are grazed it is frequently necessary to use a harrow or cart to remove the dung from one part of the field to another, and, even when this is done, it will sometimes happen that one part of a field will be over-manned, and the grass become coarse and refused by the cattle, in which case it is a good practice to mow that particular part, and remove the grass into the yards. On most of the Surrey hill farms chalk is easy of access, and a good dressing of chalk would in many cases be of great service in increasing and sweetening the herbage. Chalk is said to be a mother of grasses and clovers, and if you apply it freely, say 50 cart-loads to the acre, you may safely depend upon seeing your grass become full of white clover, &c., instead of the previous moss and rubbish. I would strongly recommend the use of the bush-harrow, and also of the heavy land-roller, about the month of April. In conclusion, I may be allowed to state that I am of opinion that most of the strong clay lands on the Surrey hills would be much better and more profitable as permanent pasture land. My own limited experience and observations teach me that the strong land to which I refer is especially adapted not only to grow grass, but to grow good grass on which beasts will thrive and do well, and, especially if you allow them a little oil cake, make themselves fit for the shambles. I admit that there is much very inferior grass to be seen; but why is it so? Is there not a cause? The question at issue between corn and grass is one of £ s. d. I would ask what sorts of crops of corn must be grown to be profitable, on land which requires not less than four, and sometimes six horses to plough it? I will venture to assert without fear of contradiction, that in average seasons, although you may be rent free, there is no profit, but generally a positive loss. In the cultivation of strong land, we are very dependent upon the season; in pasture land we have no anxiety either in seed time or harvest. I will again remind you that success in the growth of grass depends much upon doing it well. When you intend to lay a field down to grass, by all means have it in good heart, full of manure and thoroughly clean, and free from weeds; and sow good seed, not the sweepings of the hay-loft, which are frequently full of weeds. But as we are so liable to be imposed upon in the purchase of permanent grass seeds, I would strongly recommend you to apply to Messrs. Sutton and Co., or Lawson, or Gibbs, or some other respectable merchant or firm, whose commercial character would be a sufficient guarantee for a genuine unadulterated article, and also for a proper mixture of the different kinds of seeds suitable for the land; and do not pasture the young grass the first year, but mow, and mow early, not allowing the plants to run into seed, which will induce them to stock out and well occupy the ground. I feel much interested in this question; but being young and comparatively inexperienced in this part of the country, I hope to learn something from the practical observations which may fall from those around me, who have the advantage of me in age and also experience.

Mr. BROWN, of Coulsdon, said he agreed with Mr. Stables that grass-land was very profitable, but also very expensive, to lay down on a hill-farm. If the soil was not suitable for grass, it was of no use attempting to grow it. He had tried laying down land for pasture in one or two places, but it did not answer. Another time he had been more fortunate. He laid it down with red and white clover, cow-grass, trefoil, and two or three different sorts of ryegrass. He liked a mixture of seeds. He pastured the whole of the land so prepared: he did not at any time mow it. The soil was a stiff red clay, full of flints, and chalk subsoil. It was very hard work for horses to work on that land. One of his neighbours at Coulsdon laid down land of the same kind; and both were now as good meadows as could be found anywhere. The laying down of land would not do without dressings: upon that everything depended, and it must vary according to the quality of the soil.

Mr. HUNT complimented Mr. Stables upon the ability he had displayed in bringing this important subject before them, and said he had great pleasure in endorsing all that had fallen from that gentleman, agreeing as his (Mr. Stables') views did with those expressed by Mr. Hunt in the paper he had the honour of reading to the members two years ago on the same subject. Mr. Hunt impressed upon them the necessity of supplying a great defect in the manures of meadow-land, and urged the importance of using an abundance of phosphoric acid. Like Mr. Brown, he had found that the grass growing

by the road-side was stronger and more luxuriant than that grown on ordinary meadow-land, and that it also abounded in white clover. He had recently been reading a work by Mr. Cuthbert Johnson, who proved that white clover was indigenous to the soil of England, and that it was a mistaken notion with many farmers that the seed of this clover was in the bones employed as manure. He strongly advocated the laying down the sides of hills and other outlying soil into meadow-land, fully believing that, by proper attention to the manuring, &c., it would be found the most profitable.

Mr. WILSON remarked that a farmer who was a yearly tenant could not be expected to lay down land. He had tried it on one field, but it did not answer. He had pastured it; if he had mown it the first year it might have been different. He had now ploughed it up. One of the greatest difficulties in laying down lands upon the Surrey hills was the want of water. Instead of laying down for meadow land he preferred sainfoin, in which Mr. Brown agreed. His own experience of sainfoin leys differed from Mr. Brown's. He had ploughed up whole crops of it, and then had excellent crops of oats and barley. Where a farmer had meadow land he thought he should improve it by manuring. Last year he put on his meadow land London manure, which cost him £30, and whether he should get his money back again was a question he put to them. He was obliged to Mr. Hunt for the remarks he had made, for he thought they should be able to get some information from such; but he (Mr. Wilson) thought it would be more profitable to a yearly tenant to follow the four-course system and obtain his crop of hay by seeds.

Mr. CRESSINGHAM felt grateful, he said, to Mr. Stables for the paper he had read. He understood him to say that the first year he mowed his grass and then fed it. So did a friend of his; the latter laid down his ground flat, but he (Mr. Cressingham) should have preferred it in ridges.

Several members of the club assured Mr. Cressingham that the laying land down in ridges was quite obsolete.

Mr. CRESSINGHAM finished by saying that in converting arable into pasture land its adaptability for grass seeds should be first taken into consideration.

The VICE-CHAIRMAN said the subject was one well worthy attention; the paper was a most able one, and he (Mr. Humpidge) agreed with the observations made, *in toto*. He must, however, take one slight exception—where Mr. Stables said that if the pasture did not turn so well as expected mowing it late destroyed the thistles. Now he (Mr. Humpidge) never found anything would wholly exterminate them. If, however, mowing would, it was a fact worth knowing. The best time for manuring was after mowing, or, as some one had facetiously said, directly after they had got the hay off. Where land was so stiff and heavy as to require six horses to plough it, undoubtedly it had better be laid down for pasture. He thought, with Mr. Hunt, that the reason Mr. Brown did not succeed in the land he had first laid down was because he had mown it first instead of feeding it. He also thought it was very likely the right manures were not used. He thought it would have been better to have gone to some respectable firm, like that of their friend Mr. Hunt's, and have purchased those seeds best adapted for the soil. Sainfoin was a very good substitute where they could not get a permanent pasture. Sheep do better on short pasture than on long. A good deal of stock can be kept on pasture where it was a stiff land. A great deal of food was provided by turn, &c. He agreed with previous speakers, that where land was laid down a judicious mixture of seeds was very necessary. He also spoke of the disparity between the price of butcher's meat and corn, and showed that by laying down permanent pasture they would be taking a course which would prove highly remunerative.

The CHAIRMAN begged to add his testimony to that given by previous speakers as to the ability of the lecturer and the instruction conveyed in his practical remarks on the most important subject. The chairman expressed his concurrence in the general remarks of the introducer, and said that Mr. Streeter and some others of them had an opportunity last year of visiting Mr. Law's establishment, where they saw the effect produced by various experiments. By mowing the first year it allowed the grass to develop its roots and to fix itself firmly in the soil; the after-pasture was not fit till the end of autumn. Pasturing all the year after sheep was found practically to weaken the vitality of many of the grasses. In the second or

third year after sowing, the field certainly ought to have a good dressing of manure. Nitrate of soda had been found to destroy clover, either by the production of hostile neighbours or by operating immediately upon the plant. He recommended the use of phosphates in order to replace those elements abstracted by milch cows, sheep, and other animals. He agreed in the general tenor of the opinions expressed by Mr. Stables as to

the necessity of laying down meadow land, and he (Mr. Fuller) feeling the importance of this subject, promised on some future occasion to introduce for discussion the propriety of increasing the area of their grass lands.

Mr. STABLES having made a brief reply, a cordial vote of thanks was passed to that gentleman, and the proceedings were brought to a close.

## THE GAME LAWS OF ENGLAND.

BY JUDGE FRENCH.

COMPARATIVE COST OF KEEPING RABBITS AND SHEEP—GAMEKEEPERS—MORAL EFFECTS OF GAME LAWS—FOUR TO FIVE THOUSAND PERSONS PUNISHED YEARLY FOR VIOLATION OF GAME LAWS.

A gentleman in England instituted in 1845 a series of experiments to ascertain the comparative food consumed by sheep, and by hares and rabbits. He shut up two Down sheep in one pen, and twelve tame rabbits, about equal in size and weight to hares, in another. He measured and weighed their food, which was of such kinds as hares and rabbits would live upon if at large, and fed them all, as much as they would consume, continuing the experiment six weeks. During this time, the twelve rabbits consumed of oats, cut sainfoin, bran, carrots, and swede turnips, 33 bushels 3 pecks 11 pints; the two sheep consumed but 25 bushels 3 pecks and 9 pints. From this experiment it appears that four and a half rabbits consumed in six weeks within a fraction of as much as one sheep!

When we add to this enormous consumption by hares and rabbits the amount which they destroy without eating it, we may form some idea of the scourge which game is to the farmer.

It seems difficult to define bounds to the evils of this system of game laws. The great loss of crops to the farmer and to the nation is but the beginning of the difficulty. In every conceivable way are its effects disastrous. The rent of estates subject to game is always lower on that account, and this loss falls upon the landlord. In speaking with farmers upon the subject, they endeavour to console themselves with this idea; but they feel that it is a poor satisfaction for the ruin of their beautiful harvests, the frustration of their plans for the season, and their disappointment of the promise that seed-time and harvest shall not fail them, to be told that their rent is lower, because of their waste and desolation.

Gamekeepers are employed by the landlords to constantly watch night and day over the game; and the sight of an idle vagabond, wandering constantly over the farm, spying out the actions of every labourer, and of the sons and servants, too, of the farmer, lest some rabbit or partridge should be destroyed, enough to try the patience of any Englishman. The dogs and cats of the tenants are shot and trapped by these keepers, and bushes are stuck up all through his field of grain to prevent the use of nets by poachers, who catch the birds by sweeping over the wheat at night. Restrictions of various kinds are put upon cultivation, for the protection of game. One farmer is forbidden to mow his crops rather than reap them, cause the stubble may be too short to shelter the game; other may not turn his stock into his stubble till the 10th of October, lest the game should be disturbed. "I should be cleaned up that fence," remarked a farmer to us, by way of apology for a want of neatness in one field, "but we found our partridges had nests there, and were obliged to stop," and it was a farmer on his thousand acres, which his family had reaped for a generation. We looked up for a blush of shame at the servitude, or a look of indignation at the outrage, but custom had dulled the sense of wrong.

The preservation of game, again, has a tendency to prevent permanent leases. The landlord, valuing his amusements more than his money or his tenantry, will not limit his privileges; and the farmer, knowing that the game may be increased as rapidly as his crops, and may in two or three years overrun his farm, fears to confine himself for a long time to a position. All the evils of short and uncertain tenancies are thus in part attributable to the game laws.

But the evil effects of the game laws fall most heavily on the poor labourer. Whatever lessens productiveness, and renders the rewards of labour precarious, lowers the price of wages, and discourages the labourer. The prevalence of game

lessens manifestly the productive capacity of land; for even if hares were as profitable stock as sheep, they would ruin the farmer by their distinctiveness. Imagine a flock of 500 sheep running wild where they please through the crops, and we may form some idea of what their equivalent of about 2,250 hares might destroy. Farmers neglect permanent improvements from uncertainty of tenure, and so the demand for labour is lessened.

There is yet a darker shade than this to the picture, in the demoralization of the labourer. He cannot be made to believe that there is great moral wrong in supplying his starving family with the flesh of these little wild animals, which the farmer who employs him, and everybody else but the gamekeeper and the landlord, whom he sees once a year, denounces a curse to the soil, and which nobody values except as they afford a day's sport to a shooting party in autumn. Poaching therefore becomes common. Children are educated to violate the law, and a natural warfare arises between the rich and the poor. In spite of the severity of the penalties, from 4,000 to 5,000 persons have been annually convicted and fined or imprisoned for infractions of the game laws for several years past, and the public journals give frequent accounts of desperate encounters between gamekeepers and poachers. What can possibly ensue when the poor working man sees a fellow-labourer arrested and committed to prison, and there detained for an indefinite period for want of ability to give sureties for the future, or torn from his family and home, and transported beyond the sea, at the instance of some prowling gamekeeper, and all for taking a paltry hare or partridge, which consumed the very bread which his children were crying for? What can ensue from such scenes but a law-defying spirit on the part of the labourers, and hatred of the landlord and all who administer the laws? The rates are vastly increased in many parishes by the maintenance of the families of offenders, and the public peace is constantly disturbed by arrests and trials, and the suspicions and accusations, true and false, which are continually excited.

In 1848 an Act of Parliament was passed which allowed farmers to kill hares on their own holdings without a certificate; but no occupant can authorise more than one person to kill game at the same time, nor give authority except in writing and recorded. So far as the destruction of game is concerned, this Act has no effective operation. The farmers know well that they shall bring upon themselves the jealousy and ill will of the keepers and landlords if they attempt to exercise the right, and that their leases will be in danger. As an admission of the evil of preserving, and as a concession to the tenants of a point upon which landowners have been particularly sensitive, this Act is both important and significant.

The only defence of the game laws is that rural sports keep the landlords at home for their amusements instead of going abroad. No doubt a resident landlord is of far more advantage to his tenants and to his country than one who lives away from his estate; but a taste for agricultural pursuits, the desire for improvement, and the increase of his rents are motives fully as powerful as the poor sport of shooting these half-tame pheasants, actually hatched under hens and fed by the keepers, like chickens or hens, so unconscious of danger that you may kill them with a staff. A landlord who has no higher motive for living on his estate than the indulgence of this sort of half-civilized taste would not be likely much to damage his country by going away from it for a residence.—*Country Gentleman (American).*



## THE WATERING OF LANDS BY STEAM-POWER.

The present is not the first time we have discussed this topic in these columns. We return to it for the purpose of examining it from a somewhat different point of view than on either of the former occasions; and besides this, there are other and perhaps more practical reasons, for the subject is of such incalculable importance that it requires to be kept alive, as it were, in the columns of the agricultural press until it is universally reduced to practice, when it will speak for itself.

We never see a portable engine idle in the summer months about a farmer's homestead, when his pastures are burnt up, his fallows labouring under that horrible disease "*eremacausis*," alias *dry rot*, and his cattle suffering as to quantity and quality of food, both solid and liquid, than the conclusion forces itself upon the observation that "something is manifestly wrong that might easily be put right." Were there a clean crystal stream flowing in the ditch at the headlands, the cattle, from their locomotive functions, would go and help themselves, while practical men of a mechanical turn would direct the current here and there down the crown of the ridges, and thus convey the water to the parched spongeoles of the dying grasses. Now, although it may seem queer to some of our readers, it is nevertheless patent to us that the farmer's steam-engine is nothing less than a running stream in the ditch at the headlands of his parched fields, minus a few yards of piping and as many pounds of coal.

Water applied to pasture-lands when the grasses are growing should be pure, comparatively speaking—very free from saline and manurial matter, in the common acceptation of the phrase. Practically speaking, the more closely it resembles rain-water in purity, the fitter it is for being artificially applied to pastures upon which cattle are grazing; and the reason of this must appear obvious to all who have studied the physiology of growing crops at the bar of practice, for the leaves of plants have an alimentary and vital function to perform, as well as the roots; but the two functions are totally different the one from the other, in many respects; so that the agriculturist who applies liquid manure to the leaves of his grasses while growing subverts the course of nature, consequently both leaves and roots are poisoned for a time, the latter suffering from the downward poisoned current of abnormal sap. The practice may do more harm than good, as we have often experienced when applying liquid manure from the straw-yard tank at the homestead to grass-lands in the summer-time, the unmanured ridges yielding a fuller bite of sweeter grasses than the manured, until the leaves of the grasses have received a thorough wash from a heavy shower of rain, and fresh young herbage has begun to rise, possessing a healthy vitality capable of elaborating the sap, as fast as it rises from the rootlets, into an abundance of food for cattle. When a heavy crop of grass has been mown, and the swathe removed immediately, the vitality of the grass above-ground, or hay stubble, is arrested, as it were, for a short time; and during this short time a heavy dose of liquid manure of a proper kind may be applied, more especially if washed into the ground either by being in a highly-diluted state, or by a liberal supply of pure water after the manure, so as to wash, as it were, and clean the stubble, out of which the fresh herbage springs. Pastures that have been eaten very close down by sheep or neat cattle may be treated in a similar manner, the stock being removed for a time to another field yielding a full bite. We need not enter upon the philosophical *rationale* of all this, as the practical details themselves must be familiar to the generality of our readers.

The practical *rationale* of the benefits arising from the application of pure water to the burnt-up pastures is a very simple and self-evident one. The heat of the sun, for example, has removed from the land in question pure water by evaporation—such is the natural cause of the malady experienced; and the obvious remedy for such a malady is the restoration to the land of an equal quantity of pure water by artificial means, in the absence of the natural supply, viz., a sufficiency of rain-water.

Such is briefly the practice and science of watering grass

lands in the summer time. At the commencement of the season the land should be in a sufficiently fertile state to produce the grazing crop of grass intended to be grown during the summer months, and this fertile state includes a sufficiency of water in the soil. But as the season advances there is a two-fold drain upon the water in the soil, there being on the one hand a continuous evaporation going on from the surface, and on the other hand, an equally constant removal of water by the crop grown and consumed by the grazing stock. If the dews are abundant overnight, and if the clouds occasionally "drop fatness" during the day, vegetation may go on luxuriantly, cattle thrive amazingly, and graziers prosper and reap the just reward of their skill and labours; while at the end of the season their pastures may to outward appearance be nearly as rich and fertile as at the commencement. But in our fickle climate such a favourable season is the exception, periods of drought, with their long train of untoward consequences, being the rule. Hence the requirements both of the soil and of the grasses with which it is stocked.

Long periods of continuous rain are as objectionable to pasture grasses as similar periods of drought, more especially in examples of tenacious clay soils. The harm done under such conditions are manifold; for heat is carried off by the great evaporation that is always experienced during the summer time, the free circulation of the atmosphere in the soil is excluded, the finer grasses become sickly from the abnormal position in which they are placed, and the imperfectly elaborated juices of which they are formed; the coarser grasses creep up the ground, the land itself becomes impoverished owing to the absence of heat and air, together with those fertilizing processes to which they give rise when present in normal supply. Copious showers now and then are what the land requires, to keep up the fertilizing processes, and the physiological requirements of the grasses are similar.

The continuous application of water by artificial means to land is equally objectionable, if not more so, than the natural supply in excess. No doubt certain grasses will prosper in running water, as may readily be seen along the edge of rivers, or where water is allowed to flow slowly over a meadow. The irrigated meadows of the olden time are familiar examples to the point; but neither the practical nor the scientific details involved in this kind of irrigation apply to the case in question. The science and practice, on the contrary, is that of great showers of rain; so that the closer Art imitates Nature in this respect the more successful will be the result.

Water may often be artificially applied to fallow lands and fallow crops with the highest degree of success; and what may appear perhaps exceptional at first sight is the fact that wet sour clayey lands, when burnt up in the summer-time, as they are very liable to be in dry seasons, would gain the greatest benefit from an artificial supply. It is no doubt difficult to apply water to turnips in the early stages of their growth without doing harm, or to fallow crops of any kind by means of the hose and jet. After the plants begin nearly to cover the ridges, the ground may then get a good soaking without crusting or doing harm, and the watering may be kept up if necessary until the crops fairly cover the ground in such a manner, or so closely, as to prevent undue evaporation, and thus prevent further harm from continuous drought. But the hose and jet, although adapted for grass lands and naked fallows, are open to vast improvement as regards fallow crops, and even arable husbandry generally; so that the practical question arises—To what extent can improvements be profitably carried in the artificial application of pure water to land, and at what outlay of capital?

Farmers who have had an extensive experience in watering newly-planted crops of cabbages to start the young plants, and the water-drill in the growth of turnips, and those who have the farther experience of applying the liquid manure to their crops in general, will be able to form an approximate opinion as to the practicability of the project both from a physical and pecuniary point of view. They will readily perceive that profit to landowner and tenant, or interest on their respective

apital invested, will greatly depend upon their natural supply of pure water, and the facility that exists for its general distribution and application. So far as grass lands extend, the general application may be considered a determined question, even with the improvements already in operation, in a few exceptional examples, improvements universally at the command of all. In hilly districts, water, if pure and judiciously collected, may in many cases be applied by gravitation without the expense of steam power. But into mechanical details of this kind we do not intend to go, the general scope of our present paper being rather of a chemical than mechanical character. Water forms, for example, a much larger per-centage of growing crops than any other elementary substance present, and therefore it follows that when it is deficient in dry seasons its artificial supply becomes one of those tangible affairs about which a question of profit can hardly be raised, even by sceptical minds of the more scrupulous and doubting character, for it virtually amounts to the difference between good and bad seasons as to the produce of harvest, a difference which would be more than pay redeeming interest on capital twice told, provided always the natural supply of pure water is sufficiently abundant. The presence of a suitable supply of water and atmospheric air is also essentially necessary to the decomposition and incorporation of animal, vegetable, and mineral substances in the soil, so as to place it and keep it in a profitably crop-bearing state. Thus farmers from time immemorial have been familiar with the beneficial effects of a summer-shower upon naked fallows, when the staple gets literally burnt into bricks, and the subsoil fissured to such a degree as to render it dangerous to cattle, the openings being sufficiently wide to let down the feet of sheep and neat cattle, and even to make horses stumble, trip, and fall. So great are the fertilizing effects produced, that in all ages chemists and agriculturists have been prone to analyze the contents of fowls, as containing something more substantial than pure water, and consequently to put a lower estimate upon the actual effects produced directly and indirectly by water than is legitimately due to its action and presence as a fertilizer. It is no less unscientific than short-sighted, and therefore it is high time to toss to the winds at least the big half if not the whole of the nitrogenous and other utopian fertilizing theories of the day, and to lay hold on Nature by the ears, simply and practically as we find her, for the age of mystification has long since gone to the dogs with that impossibility of the chemical laboratory of the universe over which she resides. When a practical farmer both hears and sees the big oads beneath his feet hissing, cracking, and splitting up into minute fragments like lime shells when water is poured upon them, what is the use of going up and bringing down from the oads either nitric acid or ammonia to fertilize his land, however stubborn and untractable it may be in dry weather? The rational conclusion is too manifest to require a formal deduction from such premises.

But this is not all, nor even the most unfavourable state of fallow lands, in scorching, dry weather, whether naked or under crop; for the moment they are deprived of the necessary degree of moisture to promote decomposition and fertility, the opposite abnormal process of "dry rot," or *eremacausia*, begins, the elements of fertility being thus either removed from the land, or else changed into obnoxious substances injurious to the health of cultivated crops.

Our great fen districts claim a special notice, as they suffer severely from drought, whether under corn, grass, or fallow crops. Hence the practice of letting in a bottom-supply of water. But this practice is only, at the best, "the least of two evils;" for, although stagnant bottom-water may be infinitely better than no water at all, or even than pure water improperly applied by artificial means, it must nevertheless be confessed that it is injurious both to the land and to the crops it grows, for it keeps down the fertility and productiveness of the staple to a degree far below what it would otherwise attain, under a proper supply of water and atmospheric air from above, and drainage of superfluous water from below. Under this head we need not go further into detail to show the practical reader that between these two extremes there lies, in the profitable farming of fen-land, a wide field for improvement; for in most of our fen districts there is a plentiful supply of pure water at the command of the landowner: and, therefore, why should it not be brought within the reach of the tenant, for application, practically speaking?

Of the most profitable plan of applying water to fen-land under white crops, grass, or fallow, it would be out of place almost to say a word, in a concluding paragraph. The Arabs, who now farm the cradle of our race, raise the water from the Tigris and Euphrates and their tributaries in skins, and allow it to flow amongst the newly-ploughed furrows, thereby supplying air and water to vegetation; and Herodotus informs his readers that in his time the fertility of Assyria, by such means, was incredible. It is, therefore, just possible that the practice which has thus come down from the patriarchal times of Noah, Shem, Ham, and Japheth to our own day, may illustrate those principles that require to be reduced to practice in the artificial watering of our fen districts, due attention being paid to bottom-drainage and aëration, so that, along with wholesome water, the land may at the same time receive a suitable supply of atmospheric air for the requirements of the crops grown. With a plentiful supply of water-pipes and hydrants, the expense of giving grass-lands, spring and summer fallows, and stubbles after harvest, to soften them for autumn fallowing, a proper watering, would cost very little; and were an underground system of irrigation pipes laid, on the "herring-bone principle," as has often been proposed for general sewerage practice, and in several individual examples carried out on a small scale, there would be no difficulty in giving arable lands under crop one "bellyfull" after another, should they require it, in dry seasons. ENGINEER.

## WEEDS AND THEIR ERADICATION.

Weeds are a terrible pest, and an unceasing warfare must be made upon them, or they get the ascendancy, and will then have their own way. Many farmers go through grain crops killing out the weeds, and thus prevent the seeds ripening and reading upon the land. Oat fields may now be attended to, and the weeds taken out without injury to the growing grain. Weedy meadows should be cut first, especially those overrun with white daisy. This is a very troublesome weed, and when once gets possession of the soil is hard to eradicate. In passing through the country we see many fields completely covered with this bad weed, and often where there is evidently no pains taken to keep it in check. Lands overrun with daisy do not yield half a crop of grass, and are worth but half so much as adjoining fields of the same quality of soil that are free from weeds. If farmers would join together in neighbourhoods and make war in earnest upon the daisy, it could soon be forced from the soil. Where there are but few stalks these should be pulled up by hand; but where the number is very considerable they may be kept in check by early mowings, and then by heavy manuring and the use of plaster and other fertilizers may be completely subdued and exterminated.

We have tried this plan with success. The daisy does not make its inroads upon farms in extensive patches at one time. It creeps in slowly and stealthily here and there, hoping to get a permanent foothold before the farmer is aware of its bad character. It is thus early that the weed is easily overcome; but no half-way work will accomplish the business. Our plan is to sow clover, manure heavily with barnyard manure, and then plaster. By this course we get a large growth of grass, and "choke the critter off."

One of the worst pests in cultivated grounds on the black slate lands of Herkimer is quitch or couch grass. It soon gets possession of the soil, and grows with remarkable vigour. When it fairly gets into the land, the labour of getting it out by cultivating and hoeing is of no ordinary character—at least we never enjoyed the sport of hoeing it to death.

A few years ago it got possession of one of our fields, and we battled with it after the following manner: We commenced ploughing and harrowing early in June, and continued the work every eight or ten days, until in July, when the piece was rather heavily sown with buckwheat. The hot sun came down and roasted the roots, hauled out upon the surface with

the harrow; they gave up the ghost, and what remained the buckwheat smothered to death. A nice large yield of buckwheat was the result of that year's cultivation, and the next season we had a clean mellow piece of ground, with not a vestige of quitch in any of its parts. Doubtless in damp wet seasons this could not be so thoroughly effected, since many of the roots on the surface would catch and grow, instead of being roasted out.

The hot dry weather of July and August is a good time to destroy many kinds of weeds, and advantage should be taken of this time to destroy as many as possible. It is true one requires a large share of courage to make the attack on a large and weedy farm, and men often do not get credit for their efforts in this direction. We have seen one man fighting weeds with all his might, while his neighbour seemed to take pleasure in growing them, for the winds to scatter myriads of seed back again over the farm. We suppose there is no law to reach these cases, and yet there ought to be, for the shiftless neighbour is morally guilty of a species of robbery which should be recognized in our statute books.

Some western people are wiser than we of the east on this weed question. In Wisconsin they have a law making it finable for any man suffering certain kinds of weeds to go to seed on his premises, and any one has a right to complain and bring the offender to justice.

Perhaps the day may come when we of the east will become far enough advanced in weed-civilization to have such a law in force. Indeed there is reason to hope so, since we have made one progressive step recently in getting the cattle out of the highway, although many think this a sad infliction.

The New York Cheese Manufacturers Association, at their

late annual meeting in this city, passed a vote of thanks to those Legislators who were instrumental in getting a milk law. This is all right. Good acts should be recognized and services rendered appreciated; and it would not have been out of place if agricultural societies had made some recognition of the services of those who gave us the blessing of having cattle excluded from the highways.

This weed question is also an important one, since neglect and carelessness on the part of many are entailing immense waste and injury to some of our best lands. It is true the destruction and extermination of weeds is an expensive work, but then it is not money entirely thrown away, since the land is generous and willing to pay back something in increased crops. But one, after a while, gets tired of fighting weeds when farmers about him sow by the help of the winds a little faster year after year than he can destroy. We recently looked over a nice farm, where the large meadows were white with daisies, and the proprietor remarked that he had fought the weeds for years, keeping his meadows clean, but that his neighbours sowed faster than he could destroy, and so he gave up in despair and let the weeds have their way. This is only one instance out of many, and we begin to hear it asserted that daisy fodder is not so bad after all, for the herds will eat it and thrive. Of course they will eat it when nothing better is presented; but then admitting the point, see the largely increased quantity of land required to winter a cow. These daisy lands are the ones that yield one-half, three-fourths or a ton to the acre, while it takes the clean meadows of timothy or clover to turn out crops of two, three, and four tons. This point, at least, should not be lost sight of.—*Utica Herald.*

## CHESHIRE AGRICULTURAL SOCIETY.

This society held its annual exhibition of stock at Congleton, on Thursday, Sept. 28. The showyard was well selected, and the weather was exceedingly fine. Between £500 and £600 were given in prizes by the society, in addition to which special awards were given by the Marquis of Cholmondeley, J. Tolle-mache, Esq., M.P., Earl Grosvenor, M.P., the Rev. J. Thornycroft, R. Barbour, Esq., Bolesworth Castle, and W. Atkinson, Esq., of Ashton Hayes. The judges had no difficulty in awarding the first prize for the best bull above two years old to M. J. B. Glegg, of Withington; and if a second prize had been at their disposal it would have been awarded to Mr. Thomas Forrest, of Spurstow Hall, whose bull was highly commended. Mr. Forrest in other classes was decidedly the most successful exhibitor, carrying off the second best premium for a bull calf, the first premium for a pair of dairy cows, the first premium for the best dairy cow, and for the best pair of heifers. The entries for horses were larger than at the previous show, and included several very useful animals. The judges were unanimous in their commendation of the horses for agricultural purposes, and awarded the first prize for the best pair to Mr. Charles Beresford, of Elton, and the second to the Stonetrough Colliery Company, Ramsdell Hall. This company also received Lord Grosvenor's prize for the best brood mare for breeding hunters. The number of sheep entered was much fewer than last year. The judges were—For cattle: Mr. W. Fair, Aston, near Budworth; Mr. Hornby, Aston Park; and Mr. Robinson, Doddington. Horses: Mr. Davies, Eardswick Hall; Mr. Taplin, Newton-le-Willows; and Mr. Barker, of Brereton. Sheep and pigs: Mr. Hassall, Bunbury, near Whitechurch; Mr. Hopkins, Marbury, near Whitechurch.

### LIST OF PRIZES.

Champion Prize, for the best dairy of cheese, Thomas Willis, Tarvin.

#### STOCK.

Best bull above two years old, £15, J. B. Glegg, Withington. Best bull above two years, with a view to the dairy, £10, John Vernon, Willingtons; second best, £6, Geo. Willis, Ridley Hall.

Best bull calf, £3, Thomas Forrest, Spurstow Hall.

Best pair of dairy cows, £8; best dairy cow, either in calf or milk, £5; best pair of heifers, £5; and best pair of stirks, £4 second best, £3—T. Forrest, Spurstow Hall.

Tenant farmer's best yearling bull, £8, Thomas Fincher, Rushton; second best, £5, Jabez Hart, Buckley.

Tenant farmer's best bull calf, £3, John Vernon, Willingtons; second best, £2, Joseph Woolf, Haslington Hall.

Tenant farmer's best pair of dairy cows, £8, George Webb, Ridley Hall; second best, £5, Thomas Lea, Brereton.

Tenant farmer's best dairy cow, either in calf or milk, £3, Joseph Vernon, Willingtons; second best, £3, Isaac Peck, Eaton.

Tenant farmer's best pair of stirks, £4, Charles T. Deas, Astbury; second best, £3, Peter Wright, Church Minshall.

Tenant farmer's best pair of heifer calves, £1 10s., Peter Wright, Church Minshall; second best, £1, Samuel Wright, Lawton.

Labourer's best stirk, £2, George Lockett, Haslington; second best, £1, William Kay, Haslington.

#### FATTED PIGS.

Agricultural labourer's best fattened pig, £2, and second best, £2, Ralph Threadgold, Haslington.

#### PIGS, LARGE BREED.

Best boar pig, of any age, £2, William Gaman, Thornton-le-Moors.

Best boar pig, under two years old, £2, Samuel Davies, Eardswick Hall.

Best breeding sow, of any age, £2, William Gaman, Thornton-le-Moors; second best, £1 10s., Samuel Davies, Eardswick Hall.

Best breeding sow, under two years old, £2, Samuel Davies, Eardswick Hall.

Best litter of pigs, not less than eight in number, £2, Peter Wright, Church Minshall.

Best pen of pigs, four in number, £2, Joseph Robinson, Le Green Hall.

Best pair of gilts, £2, Samuel Davies, Eardswick Hall.

## PIGS, SMALL BREED.

Best boar pig, of any age £2, and best boar pig under two years old £2, H. E. Evans, Stamford Heath.

Best breeding sow, under 2 years old, £2, William Gaman, Thornton-le-Moors; second best £1 10s., Sir Philip de M. Grey Egerton, Bart., M.P., Oulton Park.

Best litter of pigs, not less than eight in number, £2, Samuel Tellwright, Lawton.

Best litter of pigs, four in number, £2, William Gaman, Thornton-le-Moors.

## HORSES.

Best pair of horses for agricultural purposes, £6, Charles Beresford, Elton; second best, £4, Stonetrough Colliery Company, Ramsdell-hall.

Best stallion for agricultural purposes, £10, Samuel Massey, Lawton; second best £5, William Horton, Haslington.

Best mare or gelding, as a roadster, £3, Thomas Poinons, Tilstone; second best £3, Thomas Balmer, Wharton.

Best brood mare, with the foal at her foot, for agricultural purposes, £5, Stonetrough Colliery Company, Ramsdell Hall; second best, £3, Peter Wright, Charch Minshull.

Best two-year-old gelding or filly for agricultural purposes, £3, Joseph Trickett, Sandiway; second best, £2, John Hornby, Minshull Vernon.

Best yearling gelding or filly for agricultural purposes, £2; Isaac Worthington, Davenham; second best, £2, John Rigby, Little Leigh.

## PREMIUM GIVEN BY THE RIGHT HONOURABLE THE EARL GROSVENOR, M.P.

Best brood mare for breeding hunters, £5, Stonetrough Colliery Company, Ramsdell Hall.

## SHEEP.

Best long-woolled ram, £3, William Brown, Wirsall; second best, £2, Thomas Richardson, Elton.

Best shearing long-woolled ram, £2, Samuel Davies, Eardwick Hall; second best, £1 10s., Thomas Richardson, Elton.

Best long-woolled tup lamb £1 10s., John Sheen, Tilstone Fearnall; second best £1, Thomas Richardson, Elton.

Best three long-woolled ewes, £3, William Brown, Wirsall; second best, £2, Thomas Richardson, Elton.

Best three long-woolled shearing ewes, £2, Samuel Davies, Eardwick Hall; second best, £1 10s., T. Richardson, Elton.

Best three long-woolled ewe lambs, £2, Richard Richardson, Sandbach; second best, £1, Thomas Richardson, Elton.

Best short-woolled ram, £3, Sir Philip de M. Grey Egerton, Bart., M.P., Oulton Park.

Best short-woolled tup lamb, £1 10s., Thomas Rigby, Darnhall; second best, £1, Joseph Beckett, Peel Hall.

Best three short-woolled ewes, £3, Thomas Rigby, Darnhall; second best, £1, Sir Philip de M. Grey Egerton, Bart., M.P., Oulton Park.

Best three short-woolled shearing ewes, £2, Sir Philip de Grey, Egerton, Bart., M.P., Oulton Park.

Best three short-woolled ewe lambs, £2; second best, £1, Thomas Rigby, Darnhall.

## NORTH WEST BUCKS AGRICULTURAL ASSOCIATION.

The annual show and meeting of this association was held Sept. 20. Owing to the prevalence of the cattle plague, the committee wisely considered it advisable not to hold the show of horned stock. The entries were in the horse classes, to make amends for the absence of horned cattle, more numerous than we have seen here on any previous occasion, and the animals themselves were for the most part of a very creditable character. The sheep entries were fully an average. In the ewe classes, besides the prizes, more than one commendation was given by the judges. The pigs were few.

The following are the awards in the different classes:

## HORSES.

JUDGES.—Mr. J. M. K. Elliott, Heathcote, and Mr. Walter George, Gayton.

The best cart mare and foal.—Prize given by the Right Hon. Lord Southampton. £3, Mr. W. Hawkins, Bourton; £2, Mr. Jonas Paxton, Bicester.

The best cart filly, under three years old.—£2, Mr. E. H. Ridgway, Bourton; £1, Mr. James Bennett, Stowe Castle.

The best cart gelding, under three years old.—£2, Mr. Thomas Lines, Hillesden; £1, Mr. John Barge, Cowley Lodge.

The best yearling colt or filly, for agricultural purposes.—First prize given by G. Morrison, Esq. £3, Mr. R. Webb, Steeple Claydon; £2, Mr. Linnell, Leckhampstead.

The best hunting-like gelding or mare, above four or under five years old.—Prize given by J. G. Hubbard Esq., M.P. £5, Mr. Elias Clark, Lillingstone Dayrell.

The best hunting-like gelding or mare, above three and under four years of age.—Prize given by J. G. Hubbard, Esq., M.P. £5, Mr. R. Treadwell, Shalstone.

The best yearling nag, colt or filly.—Prize given by Mr. R. Treadwell. £3, Mr. John Simpson, Pottersbury.

## SWEEPSTAKES.

For the best nag, colt or filly, above two and under three years old.—First prize, Mr. W. Chapman, Westbury; second prize, Mr. T. Barge, Hillesden.

## SHEEP.

JUDGES.—Mr. R. Doig, Lillingstone Lovell, and Mr. William Reeve, Passenham.

The best half-bred shearing ram.—£1 10s., Mr. R. Treadwell, Shalstone.

The best ram of any age or breed.—£1 10s. Mr. R. Treadwell.

The best ten Down ewes, that have suckled lambs up to June 20th.—£2, Mr. James Bennett, Stowe Castle.

The best ten long-woolled ewes.—£2, Mr. Thomas Chapman, Westbury; £1, Mr. John Treadwell, Radcliffe.

The best ten half-bred ewes.—£2, Mr. A. C. Swain, Radcliffe; £1, Mr. C. Bennett, New Inn Farm, Stowe.

The best ten half-bred theaves.—£1 10s. and silver cup, Mr. Thomas Ridgway, Bourton Grounds.

The best ten ewe lambs, of any breed.—Prize given by C. Pilgrim, Esq. £2, Mr. John Treadwell, Radcliffe.

## PIGS.

The best boar, of any breed, under three years old.—£1 10s., Mr. B. Lines, Water Stratford.

The best sow, of any breed, in pig or with pigs at her side.—£1 10s., Mr. Lines, Water Stratford; £1, Mr. C. Bennett, New Inn Farm, Stowe.

## CHIPS.

## III.

In No. I. of the present series we detailed in briefest fashion some of the principal points connected with the saving or what has been called the manufacture of manure, or farm-yard dung: what remains of the subject we now propose in the same fashion here to take up, this having reference to *the employment of it upon various soils*. The degree to which the fermentation should be allowed to go will depend, or should depend, upon the nature of the soil we apply it to. We have alluded to the chemical value of dung; but another property, and that a highly-valuable one, is the mechanical. This property is brought into play in the case of heavy clay soils. These being close in texture, and in many cases almost impervious to water, it is necessary that they should be opened up, as it were, and made porous, so as to admit the atmospheric influences to soften, mellow, and pulverize it. Hence for soils of this kind it is almost impossible to use dung in too fresh or "long" a condition; it should be used indeed, in the heaviest class of soils, before fermentation sets in. And it is, as Professor Tanner remarks, very satisfactory to know that all the chemical changes brought about by means of fermentation are brought about after the fresh dung is ploughed into a heavy clay soil—"far more perfectly than if we retained it under our own control"; and, further, that there is not the least danger of loss from imperfect fermentation, for the absorptive properties of the soil guard with jealous care all the products of decomposition, and preserve the same until yielded up to vegetation. Nor is it less satisfactory to know that fermentation going on within a cold, clay soil induces that heat which tends to raise their temperature. But when we have to deal with light, sandy soils, a very different condition of the manure is required. Being light, and in many cases over-porous, consolidation of the soil is required; so that well-rotted manure, or "short" dung, as it is termed, is what is wanted for this class. It is a curious circumstance, that while the mechanical requirements are met by thus using short or highly-rotted manure for light and sandy soils, the chemical requirements are also met. Light soils, unlike heavy ones, pass water and moisture with facility, so that the fertilizing matters in the manure supplied to them are apt to be readily worked out of them and passed to the subsoil or to the drains; hence the advisability of having the manure well-fermented previous to its being ploughed into the soil, and applied moreover just before the crop is put in, so that the plants will begin to draw upon the manurial agents in the manure as soon as possible. In cases where the manure is applied as a top-dressing to grass lands, our authority states that he prefers it moderately rotten, especially if applied early in the winter; that the later it is applied in the winter the more rotten it should be. Professor Voelcker has shown that the loss sustained by spreading manure over clay land, and allowing it to be exposed for some time, is very inconsiderable. This, as we stated in No. I., is, however, corroborated by other authorities, as, for instance, Mr. Baldwin, whose opinion we shall presently give. Dr. Voelcker founds his belief upon the results of his experiments, which go to show that the loss sustained by farm-yard manure does not arise from the evaporation of its ammonia, but chiefly by the washing out of its valuable constituents by the rain, that is when it is exposed in heaps in the corners of the fields, or in uncovered badly-

arranged pits in the farm-yard; and that, in place of putting it in heaps in the fields, it is better to spread it out at once over the surface, because then fermentation is stopped, and the soluble matters, if soaked out by rain, are washed into the soil. "In the case of clays," says the Professor, "I have no hesitation to say the manure may be spread over six months before it is ploughed in without losing any appreciable quantity of manuring matter." On this Mr. Baldwin remarks that he could well understand the soundness of the Professor's views of the valuable constituents if the manure spread over the ground were at once washed into the soil by showers, and if fresh showers fell in proportion to or at the time of the formation of fresh supplies of ammonia. But a little consideration will show that this fine adjustment of showers of rain to the ammonia produced will not be obtained in practice. Mr. Baldwin maintains that the theories of Dr. Voelcker are not tenable, which hold that manure contains a "mere trace" of ammonia in a state ready to be dissipated in the air, and that during the fermentation of manure "the total amount of nitrogen scarcely suffered any diminution." Mr. Baldwin points out that in a ton of well-rotted manure there are 1.03lbs. of ammonia in a free state, and in fresh manure .76: while of ammonia in a form of salts easily decomposed by lime there are in a ton of well-rotted manure 1.27lbs., and in fresh 1.97. Mr. Baldwin further maintains that, if spread on the ground in dry and warm weather, all the free ammonia would escape. The per-centage of this, or the amount of it in a ton, is certainly small; but if one looks at the amount in a usual application per acre—say 20 tons—the figures mount up rapidly. Thus in 20 tons we have 15lbs. of free ammonia, which at 6d. per ton gives 7s. 6d., as Mr. Baldwin says, the farmer would consider a "crushing tax." One point of practice is, at all events, worth noting here—that the practice of spreading out dung is increasing, and that in some districts the after-crops have been proved to be better in quality and greater in quantity than where the opposite mode has been adopted.

## IV.

The management of *calves* has formed, and, we need scarcely say, forms more than ever one of the most important departments of farm economy; yet, like many other branches of practical agriculture, much diversity of opinion exists as to the best mode of securing the best results of good management; or, to put it in another way, farmers disagree much as to what really constitutes good management. Some insist upon the calf being milked by its mother, as being the most natural, and therefore the most economical way to proceed; others maintaining as decidedly that this mode is as wrong in principle as it is bad and wasteful in practice. Some maintain that the mother's milk, if not allowed to be taken from her by the calf itself, should at all events be given to the calf by hand; others insist, upon the contrary, that the best results are obtained by feeding the calf upon artificial food—the nature of this again giving rise to a contrariety of opinions as to what should or should not be in it. Who can, therefore, decide where doctors disagree? it may be asked; while good service may be done in glancing at the varied practice of the farmers of modern times, which we propose doing in another "chip." We meanwhile content ourselves by making the subject of the present one a

resumé of what Professor Tanner says on the subject, in a very elaborate paper published in the "Journal" of the Bath and West of England Society. This able authority sets out by pointing to the fact that nature has provided in the milk of the mother a "perfect food" for the calf. Taking the analysis of milk as given by Hadlein as follows—

Water	...	...	...	...	...	87.24
Butter	...	...	...	...	...	3.00
Milk-sugar	...	...	...	...	...	4.40
Casein	...	...	...	...	...	4.80
Phosphates of lime, magnesia, and iron	...	...	...	...	...	0.35
Chloride of potassium and sodium	...	...	...	...	...	0.17
Soda combined with casein	...	...	...	...	...	0.04
					100.00	

—we see among its various ingredients substances destined to perform the various offices in supporting the life, building up the frame, and forming the tissues of the animal. In the butter and the milk-sugar we find highly combined compounds fitted to keep up that supply of warmth and to supply that free respiration so essential to the healthy development of the young animal. In the casein we have a nitrogenized substance, useful in forming the flesh and tissues; while in the phosphates of lime and magnesia we have those which build the frame and strengthen the bones. In the iron we find a substance which will afterwards be present in the blood, as will also be the case with the alkalies and the salts. If, then, an artificial food is to be used in preference to the natural food of the mother, this is the model we must have in view when we make it. But here we interpolate a caution of our own, which is probably worthy of some attention; and this is, that however closely the ingredients of any artificial food may resemble those which analysis shows to be in the natural milk, and however carefully the proportions may be attended to, it will be altogether erroneous to suppose that the artificial food will be as valuable for healthy feeding purposes as the milk of the mother. The best imitation that man can make of any of nature's products must of necessity be of lower value than the original. This, indeed, is involved in the meaning of the term "imitation," which must at the best be always an approximation merely to the thing imitated. It is a dangerous fallacy—and one which lies at the root of much of the false practice of the present day—that chemical analysis alone is all that is necessary to make known the exact nature and value of feeding materials. The chemist, by his test tubes and his scales, may eliminate and weigh to the minutest point the ingredients and proportions, say, of a turnip; but what chemist, with his finest skill, can, with these very ingredients, bring back the vegetable to its original form? There is a subtle something—the hidden link of a chain which binds all together—ever eluding man's skill. It is well that man should be thus kept humble, by ever appearing to be about to cross the threshold of the house of life to gain its important secrets, but ever stumbling, and never crossing. The very point which he may deem trifling and of no value may just be that which constitutes the whole value. Chemists, for example, tell us that the water existing in a vegetable is of no value, and therefore is put out of reckoning. Who can tell? Perhaps the water, in the peculiar form in which it is present in the produce, is the very substance required to bring into play the nutritive qualities of the other constituents, without which they would be inert. In the absence of proof to the contrary, it will be wiser to believe that water has an important office to perform, otherwise it would not be present in the plant. Every substance in every produce does play an important part, whether we know it or not: all are, in one sense, separate and independent of each other; yet all are linked together in a bond of closest intimacy.

We talk of playing "Hamlet," and leaving out the Dane; but where all the characters are unknown, who can tell which is the Dane? Better, to take the rôle complete as it comes from the Master-manager's hands. To return to the more immediate matter in hand—not that we deem any apology necessary for this digression, which, whatever may be said for it, it cannot be said of it that it is altogether unsuggestive. Professor Tanner next refers to the two modes of giving the calf its food—by allowing it to suckle the mother, or by giving it the mother's milk by hand. Of these two, he is a decided advocate for the first of these two methods. The milk being the same, surely the way in which it is given cannot be of much importance. "Yea," says the Professor, "it can;" and careful observation will readily enough prove that the suckling process, while it is the natural one, is the best—nay, the best because it is the natural one. The stomach of the calf is, like that of the maturer animal, divided into four compartments; but these are not all brought into use in the early stages of its existence. If, then, allowed to drink freely, the milk is passed into the stomach at a rate much faster than the digestive process goes on, so that it becomes deposited in the rumen, and entire disarrangement of the digestive process is the result; but, by the process of suckling, the passing in of the milk is gradual. Moreover, we do not know, but we may almost guess with certainty, that the pleasurable emotion raised in the animal by the process of suckling has a most beneficial action upon its health. Nature does nothing in vain: she has no superfluous arrangements. When will this truth be recognized and acted upon? But in addition to the advantages obtained by allowing the calf to suckle the cow, we should not forget that we also obtain advantages by the process promoting the comfort, and, in the comfort, the health of the mother. Still further, we find—as a further inducement for farmers to follow the dictates of nature in the suckling of calves—that the milk of the cow, immediately, and for some short time after calving, is of a quite different nature from that at ordinary times. In this condition—known technically by the name of "beisting"—it exercises a most beneficial influence upon the digestive organs of the calf. It is, in fact, a medicine admirably suited for the condition of the calf at its earliest life—kindly provided by nature. But we must say (if, indeed, a harmless joke is here permissible) the medicine must be taken out of nature's bottle by the patient itself. To sum up on this head, Professor Tanner says: "There is no plan so well calculated to promote the health and development of a calf as allowing it to suck the cow."

Another important point in the early management of the calf is the giving only of liquid food. Solid food is often given, but it is invariably attended with loss of ultimate condition, for by it those stomachs which are not intended by nature to be brought into early use are so brought, and by consequence weakened. The best breeders, the Professor notes, give their calves liquid food for so long a period as eight or ten weeks. If the advantages or supposed advantages of the solid ingredients of artificial food are desired to be given to the young calves, let them be given as recommended by our authority, through the medium of the mother. Feed her upon them, and the calf will not lose them. Where milk is given by hand, in addition to the losses we have noticed already as resulting from the practice, there is another which is likely to be also brought about, and it arises from the temptation there is to give up, after the first two or three weeks, the use of the milk as it is taken from cow, and to substitute for it skimmed or scalded milk. The result of this is that the animal afterwards is sure to be "a rank coarse-boned" one, arising from the milk having a superabundance of bone-producing constituents, and a lack of fat-producing matter. This last fault brings

with it moreover another evil, for in proportion as the fat or respiratory compounds are reduced, so in like manner is the warmth of the animal reduced, and in proportion also its growth. This will also prove the importance of having good shelter for the calf. Exposed as it is too often shamefully—shall we not rather say shamelessly—to cold and wet, the animal is sure to suffer, and the master's pocket also; only for the latter we do not care a jot, for he deserves it, and far worse than that. We

have no sympathy with the cowardice of cruelty. Together with good shelter, exercise must be provided for the calf, that of course of a well regulated character; this exercise enables all the parts of the body to be duly developed. Such is a rapid *resumé* of what our authority has said on this important subject of rearing calves up in the time of their weaning; and if attended to, he pledges himself the "best results will be obtained," but if disregarded "the consequences cannot be satisfactory."

## MOUNTAIN RIVER IMPROVEMENTS.

In our Highland districts the narrow strips of land on the banks of the rivers often possess a higher value than they are intrinsically worth, because they furnish bread corn to the inhabitants, and thus save the expense of buying it from a distance. Improved roads and methods of steam conveyance have brought many of our Highland glens and habitations nearer, as it were, to the corn-growing farms of the low country than in the olden time; but in doing so they are at the same time increasing the value of their animal productions, so that they still maintain a higher comparative value than were the whole country subject to the plough.

It is no easy matter defending these highly picturesque and valued spots of land from the irresistible fury of the swollen torrents that roll between them during heavy storms. To all who are versant with the force of a large volume of water flowing down a steep incline, the surprise is that an inch of land remains on either side on which the foot of man can find a safe resting-place in a thunderstorm, when all around re-echoes the impetuous fury of the watery elements, that foaming rush down the hillsides and ravines, swelling the accumulating force of the gathering deluge that irresistibly rolls below; and for a similar reason all who are thus qualified to form an opinion on the subject must equally admire the manner in which Nature stretches forth her powerful arm to rescue these sacred spots from the apparently inevitable ruin with which they are thus threatened.

It requires a clear eye and a comprehensive mind to see practically the details of the subject throughout its length and breadth, even under ordinary circumstances. If we go, for example, to what is usually, but fallaciously, termed the fountain-head, that bubbling issues out of the hillside, forming a basin out of which the infant river gently flows, we there behold Nature antagonistically balancing certain forces against each other as it were, but giving to one preponderance, so to speak (*i.e.* the infant stream), an advantage over its rival, so small as if purposely to prevent it doing harm to the fertile strips of land on either side, as if they were intended by her to form for the time being a sort of Paradise for our fallen race; and from the fountain-head of the river to its confluence with the ocean we see throughout its whole length the same laws of Nature beautifully exemplified in order to prevent the washing away of the lands which otherwise would inevitably take place.

It is to these laws of Nature and the *modus operandi* in which they are carried out into effect that we wish chiefly to turn the reader's attention in this short article, our object being to show the absolute necessity of attending to those laws in the improvement of rivers in mountainous districts. The water that bubbles up in the bottom of a spring well on the mountain side, or that issues in a flowing stream from the crevice of a rock or the like, does so in obedience to the law of gravitation, thus proving that the true fountain-head lies at a higher level. In short, the bursting clouds on the hill-top are the true fountain-head of the river. When the rain-water collects in the fissures of the rocks of which the mountain is chiefly composed, the hardness of the rock prevents its being washed away. In cases where the rock is soft, large caverns are eventually made, from the washing away of the soft materials of which the rock is formed. When the water again falls from a considerable height over the ledge of a rock, forming a "lin," "tarn," "waterfall," a basin is partly scooped out below, and partly formed of the materials thus scooped out by the force of the water; and this scooping-out process continues to go on until the depth of the water in the pool is suffi-

cient to counteract the downward force of the current. In other words the hydrostatic pressure of the water in the pool counteracts the force of gravitation of the waterfall. When the water rises up in the bottom of a well, the hydrostatic pressure of the water in the well counteracts the upward force of the bubbling stream, and thus prevents the washing away of the soil. Now, although in these two examples there is an apparent difference, the laws of Nature are in both cases similar, the only difference being that in the former case the water is seen flowing into the pool or basin, whereas in the latter its descent into the pool is invisible, the stagnant water in the porous soil rising to the level of the surface of the water in the well. In principle, therefore, the two cases are identically the same, the hydrostatic pressure of the water in the pool counteracting the force of gravitation of the waterfall or flowing stream, thereby preventing the washing away of the soil, which otherwise would be the inevitable result.

The two laws in question thus involved in the natural formation of mountain rivers may be, and are, in point of fact, very instructively illustrated by pouring water into a tumbler from a decanter. When the water is poured into the empty tumbler it strikes the bottom with a force directly as the height from which it is poured; but as the water rises in the tumbler the force against the bottom becomes less and less, from the counteracting hydrostatic pressure of the water upwards, until the influent current eventually ceases to reach the bottom, the upward force being greater than the downward one. The experiment is a very simple one, and highly instructive in every agricultural class-room where this branch of agricultural science is experimentally taught; and those of our readers who are still apprentices to their profession, and consequently students, should perform the experiment in all its diversified details, so as to comprehend thoroughly the practical lesson which it teaches.

If the channel of a mountain stream is examined, it will be found to consist of a series of inclined planes and basins, forming pools and rapids from its source to its confluence, the series consisting of a rapid and pool alternately. Thus if we take the example of a spring well on the hillside, or at the bottom of a hill, as the assumed fountain-head of the river in common parlance, then the standing water in the well and the trickling of the water through the porous strata of the hill into the well form the first couplet in the alternating series. The water flows up into the well generally at the bottom, with a considerable force rising upwards above the surface, giving rise to a small ebullition or it may be a jet or spout several feet high. The water, on the contrary, issues from the well in a comparatively placid state, flowing down an inclined plane with an accelerated velocity into the basin immediately below; this inclined plane and basin forming the second couplet, or rapid and pool, in the series. In this manner the river continues to flow down rapids into pools throughout its whole length, leaving the upper pool with what may be termed a minimum velocity, but entering immediately below with a maximum velocity.

It will thus be seen that in the natural formation of mountain rivers certain laws are attended to with scrupulous exactitude, and in their artificial improvement or formation, the same laws of Nature being in force, they must consequently be respected with equal fidelity. It follows, therefore, that the natural example forms a pattern in every case for art to work by or imitate in the improvement of rivers of this class or the formation of new channels, and that unless the pattern which Nature thus gives is closely imitated or copied, those who thus



disobey her laws will be punished according to the magnitude of their transgression, by having their lands washed away until Nature forms a new channel on sound philosophical principles.

How oft have Nature's laws been violated in this respect! The humbling facts of the case may best be left to bespeak their own reproof in all our highland districts. When examined in the light of experimental philosophy, they unquestionably read the advocates of professional education for the rising generation an instructive practical lesson. In a former paper it was shown that the geometry of a ditch or river in comparatively level ground involved the elements of the fifth proposition of the first book of Euclid, *alias* "Pons asinorum"; and we may here pause to ask the reader, How many highland lairds there are, who in the formation of ditches and rivers have practically, as it were, crossed with flying colours "the bridge of asses" (Pons asinorum)? And the obvious reason why so many of them have wet their "tartans" is because they have never studied the laws of Nature exemplified in pouring water into a tumbler, and how those laws are to be loyally observed in the drainage and improvement of their estates! The case is, practically speaking, a very clear one, and therefore we may with becoming propriety leave it to stand upon its own feet; for in theory straight channels with uniform inclinations and flowing rivers must be admitted as sound doctrine, the natural rule of pools and rapids resolving itself into the practical question of preserving the channel in accordance with the theory at issue. In other words, if the channel of a mountain river can be straightened and preserved in a uniform inclination, such is unquestionably its proper form, as it will carry off the greatest quantity of water in a given time and in the smallest sectional capacity of channel.

In straightening the channel of a mountain river or open ditch of considerable inclination, its preservation in the above form is therefore a cardinal question in practice. The too common plan is to leave the newly-formed straight channel to take care of itself, both sides and bottom! in which case Nature commences her own plan of pools and rapids, in order to incur the least possible havoc and sacrifice of land. The unsightly work that in too many cases follows need not be told to those who are practically versant with the matter, for we have seen a ditch only three feet in depth cut down in a few seasons to the rock lying at a depth of more than a hundred feet below the surface, thus forming a huge ravine in itself "*a small highland glen*."

The true plan in all such cases is for Art and Nature to co-operate together in the improvement of the river; and in order to do so effectually, the draining engineer requires to investigate maturely the practical details of the work, before he commences to break the surface and divert the river from its old

channel. In all such undertakings we ourselves have found, from considerable experience, that book-rules are of no use in the vast majority of cases. In other words, every case must be its own rule. When the bed of the river only requires to be repaired the old one may be taken as a practical rule, or rather pattern to work by, as formerly stated. But when the channel is either straightened or narrowed, then this old rule does not wholly apply. Thus, in the former case, for example, the channel is shortened and the inclination increased, consequently the velocity and force of the current are also increased. Hence the greater havoc which the bottom and banks sustain during the first flood. In the latter case, again, the depth of the river is increased, by the narrowing of the channel, which also increases the velocity and force of the current, so that the ultimate result is similar to that of the former case.

The natural rule or pattern which Nature gives to work by is to increase the depth of the pools, as the velocity and force of the current are increased, and to decrease the inclination and length of the rapids. In the latter half of the work much depends upon the quality of the materials of which the channel of the river is formed. The natural rapid is formed by the accumulation of the largest stones forming a bar across the river, and where there are not many large stones Art may co-operate with Nature by throwing large stones into the smooth water above the rapid, so as to increase the height of the incline and depth of the upper pool. But by doing so the lower pool will be endangered, and hence also must be deepened in a similar manner, otherwise the stream may break through and leave the channel the first heavy flood. And so on until the natural equilibrium is restored throughout the whole series of pools and rapids involved in the work of improvement. In cases where rocks crop out in the bottom, so as to form a rapid, advantage may be taken of them to effect an equilibrium of all the pools and rapids below.

In the formation of a new channel, whatever may be its size, whether that of a small ditch or drain, or of a large river, wires of rude mason-work may be formed across the stream at short intervals, so as to form either artificial pools and rapids, or pools and waterfalls, thereby preserving the channel of the drain, ditch, or river in its original form or shape; and in all examples of considerable inclination this method of co-operating with Nature should never be neglected at the outset. The practical rationale of this need hardly be told, as the expense in the outset invariably amounts to only a small fraction of what it costs in the long run, while the destruction and sacrifice of land are avoided. By thus co-operating with Nature, the pools and rapids and pools and waterfalls thus formed by Art will not only preserve the channel in its original form, but also greatly add to the beauty and value of the river.

## THE PRODUCTION OF ENGLISH CHEESE.

SIR,—The manufacturing of English cheese is daily becoming a most important question. The price of cheese is yearly advancing; and may I ask in what way it may be accounted for? Is it by reason of the consumption being greater, or by the principle of a decrecent production?

We have heard much of the American cheese, and we are well aware it is very largely imported into this country. Notwithstanding the supply from America is increasing, the scarcity exists, and extends. Amongst the supply some can be found "quite the cheese"; but we are burdened with the thought that the whole supply is becoming more inefficient to provide, and more inadequate to supply, the wants of an ever-increasing English population. While I acknowledge the home consumption and the supply from abroad to have increased, I cannot but lament that the production of English cheese has been on the decrease. In these remarks I make especial reference to the midland counties. I am unable to speak with any degree of confidence of the dairies of Cheshire, Gloucestershire, or other cheese-making counties; but of dairies of the midland counties I do say that, during the last twenty years, there has been a gradual, though now it has assumed the form of a radical, change. In my own parish there is 67 per cent. less cheese made than twenty years ago; and many other parishes in Leicestershire are at as great if not a greater ratio.

The cause of this change in the farming of these counties is to be attributed to the advance and altered mode of living of agricultural society. One main reason is the anxiety, trouble, and annoyance of cheese-making in the household. We readily admit the impossibility of the mistress obtaining the three household requisites of neatness, cleanliness, and regularity, when the business of making cheese is performed in what should be a private house. The other reason which I may mention lies with the dairymaid. This personage and the milkmaid, which our ancient poets did so much to celebrate, are fast losing that renown which was formerly attached to them, and, I am firmly persuaded, will soon be of the past. The dairymaids that are to be obtained are chiefly of that class which requires the strict eye of the mistress to make cheese-making successful. It is a notable fact that the breed—if I may be allowed to use such an agricultural expression—of dairymaids is yearly diminishing. I think the time is far distant when cheese-making apparatus—although I far from overlook the usefulness of many—will be very generally adopted by Leicestershire farmers. Unless there is some system pursued by which it can be manufactured independently of the farmer's private residence, I see no other than that the making of cheese will continue on the decline.

Will it serve the best interests of the country for cheese-making to be discontinued? I think I may say, for many rea-

sons, it will not. Without cheese-making we should be struggling against a scarcity of stock. It is clearly perceptible that an abundant supply of stock is co-existent with the dairy, and *vice versa*. Is it not probable that the present cry amongst farmers, of the dearth of store animals, may be accounted for in this way? If all will be feeders and none will be breeders, we shall no longer be independent of other countries for our supply of either stock or cheese. Dairying is objected to by some on account of its impoverishing nature; but, with liberal feeding and an occasional dressing of some fertilizer, this ob-

jection may be overcome, and the profit remaining may be handsome.

If, then, it is desirable that cheese should continue one of the principal products of British agriculture, what system can be adopted to promote that desire? I say firmly, but emphatically, the American. The various cheese-making apparatus might be used with great advantage; and the economy in power for pressing, and the saving of labour, in an establishment on a large scale, might be such as greatly to reduce the cost of making. Yours, T. J. S.

## SACCHARIZED GRAIN FOR FEEDING PURPOSES.

SIR.—Since my last letter appeared in your widely-circulated journal on the properties of saccharized grain for feeding purposes, I have been inundated with letters of inquiry from gentlemen in all parts of England, and from France, as to the manner of preparing the grain. Herewith I inclose you a description of my method of saccharizing wheat and barley, by doing me the honour to print which in your next copy, you will greatly oblige me and will be doing a very great service to every British stockmaster.

A malt-kiln is not required, neither does it appear that grain as prepared by me is subject to excise laws.

Germination of grain is much influenced by temperature, hence difference of summer and winter fabrication. A difference of management of wheat and barley is also required.

**WINTER SACCHARIZATION OF WHEAT.**—Steep 48 hours, drain off all loose water (24 hours are required for drainage), spread the grain 12 inches deep in heating box, and cover with cloths: avoid all lower currents of air. Heat generated, which occurs in about 24 hours, and a smell similar to fresh-drawn cider, are guides favourable to the process—diastase is generated, and a sprout is about to form. A putrid, sour smell is to be strictly avoided; a fungus will be the result of this change, and one end of the grain will be found brown-black in colour. Immediately a sprout is seen outside the grain, turn the germinating heap into box No. 4 and spread 6 inches deep, turn from box 4 to 5, and so on every 24 hours, and the process will be effected in from 10 to 12 days. The grain of 1864 required as many as 18 days to effect a similar change.

**SUMMER SACCHARIZATION OF WHEAT.**—Steep 40 hours, drain as in winter, spread seven inches deep in heating box (no cloths are required for summer), closely observe the heat and smell as before alluded to: if too much heat and no sprouts are formed, furrow the mass, done simply by forcing a blunt piece of wood through it (a process which maltsters call ploughing); sprouting commenced, turn into box No. 4, and repeat the turning every 12 hours, spreading the grain four inches deep. Here will be observed the difference between summer and winter management, and that double space is required in summer for the same quantity.

**WINTER SACCHARIZATION OF BARLEY.**—Steep 60 hours, and even 60 if the grain has been harvested in a very dry summer; drain the grain 24 hours, spread 18 inches deep in heating bed, and cover with cloths. Observe the same heat, smell, and stage of germination as in the wheat. Turn from box to box every 24 hours, spreading 10 inches deep. Barley during winter requires little turning; it may, indeed, remain in box No. 5 until fit for use, that is until the sprouts begin to clasp each other.

**SUMMER SACCHARIZATION OF BARLEY.**—Steep 48 hours, drain 24 hours, spread 11 inches deep in heating box, 4 inches in other boxes, turn every 12 hours, observing more frequent turning in summer than in winter. It will be fit for use in from 8 to 10 days.

The water must be clean and changed for every steep.

Double space is required for summer as for winter fabrication. Steep enough at one time for three days' consumption; for example, for 64 sheep three bushels; this quantity will give each sheep one pint daily for three days.

Immediately one lot is taken from the steep, place in another sufficient for three more days, and then a third immediately the second is removed from the water, and so on until all the different compartments are occupied and so regulate the supply to the demand.

To germinate grain in summer much more attention is required than in winter; high atmospheric temperature so much

influences the saccharizing process (wheat especially), dextrine being formed, and turning the grain not being attended to, it exudes from the surface of the grain, which, with the decomposing albumen and gluten, causes the heap to become one adhesive and putrefying mass.

The more the grain is drained after removal from the steeping-tub the more kindly it will germinate: the draining-vat requires elevating from the ground.

Wheat in germinating increases one-half, barley one-third in bulk.

Where roots or grasses are used and sheep require fattening, each sheep may have of germinated wheat one quart, of barley three pints daily, mixed with chaff.

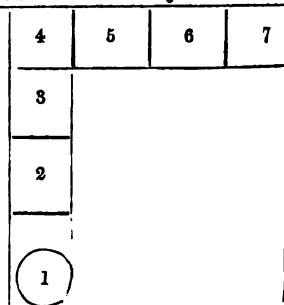
Germinated grain is a perfectly harmless food, hence its greater value over all other feeding stuffs. After a week's feeding a sheep may consume half-a-peck daily, and not be injured; the youngest lambs may eat of it with safety.

The boxes, as shown in the plan, are very important. The same depth of grain can be kept at the sides as at the middle of the heap, and the grain requires but little stirring after being taken from box No. 4.

The grain requires to be only half the depth in Nos. 4, 5, 6, and 7 boxes, as in No. 3, the heating-box; heat is spontaneously generated in No. 3 box. The grain in the heating-bed only requires covering with cloths, and in this only during winter, unless from excessive cold germination is checked: in that case the grain requires covering in any of the beds or laying of greater depth.

It was when my experiments were limited to the feeding of a few scores of sheep, and during winter, that I found boxes so extremely useful in procuring saccharization of the entire bed; but now that saccharized grain is becoming so extensively used (on one farm alone 14 sacks per week are being consumed, and another flockmaster is making arrangements for preparing 40 sacks per week), it has been found more convenient to work the grain during the saccharizing process upon a floor.

PLAN FOR SACCHARIZING SMALL QUANTITIES OF GRAIN.



1. Macerating tub; 2. Draining-vat; 3. Heating-box; 4, 5, 6, 7. For working the germinating grain.

The boxes should be of a size to hold just enough for three days' consumption—3 feet square, 11 inches deep will hold 4 bushels of raw grain. Only have boxes of proper size, and the smallest quantity of grain, even a quart, can be germinated. The boxes are made simply by placing an 11-inch deal upon the edge from side to side of a floor, and the space so formed intersected by other pieces of deal of the same depth (see plan).

Yours, &c., ISAAC SEAMAN.  
Priory House, Saffron Walden, Sept. 16, 1863.

## THE CATTLE PLAGUE.

BY A PRACTICAL FARMER.

There cannot be too much written or too much said with the view of rendering the whole community extremely cautious and careful to prevent the spread of this awful pest—"The Russian Cattle Plague" ("German Rinderpest"). It is worthy of all praise to find that the whole British Press takes the question up and discusses it so fully. We don't care for a few exaggerations. It all tends to inspire caution. We all want to stop the further spread of the plague, and it cannot be more readily done than by the diffusion of the details of its ravages, through the Press. Orders in Council and public meetings are all right and proper, and their orders and proceedings highly commendable; but it is the Press—the diffusion of the knowledge of the dire effects of the plague—that will put the British public on their guard. I acknowledge, indeed I know, there has been gross exaggerations of the progress of the pest, and of individual losses more particularly; but it has had a good effect. Every grazier and cow-keeper is fearing the attack, and is preparing to withstand or frustrate its evil powers. And this is all they can do, for we learn the disease is incurable, and a very alarming announcement it is. It is not meant, however, by this word "incurable" that no animals will be restored to health after the attack, but simply that no application of any remedy nor any treatment known in veterinary practice is of any avail. And this is my great object in penning this paper. There is no correct treatment or remedy for the disease, known in veterinary practice. What, then, is to be done? Why, all depends upon isolation and good nursing. What is the first course? It is this: The instant any animal shows signs of unusual languor, staring coat, drooping ears, and running eyes, put it aside, and send for the farrier. If the farrier cannot clearly decide what is the matter—that the symptoms are new and novel—by all means get to the best possible nursing—*i. e.*, warmth in cold weather, coolness in hot, good ventilation and cleanliness, and the efficient use of disinfectants. Lime, gypsum, or chloride of lime, &c.—even brickdust or sawdust, or dry ashes, or earth—is better than nothing. Then as to food: If the animal will touch any, which is very doubtful, let it be of the best and sweetest kind, *i. e.*, grass and hay cut into chaff, pulped roots, bran, grains; nothing that is heating ought to be given. Then the chief hope is in unremitting attention to the frequent administration of stimulating drinks and nutritious gruels. For stimulating drinks use ale, whiskey, gin, brandy; ginger may be used freely. For cordials, gruels, and drinks, oatmeal, linseed, treacle, gentian, &c., is desirable, and as being in every farmer's possession; but the chemist would also supply some very useful and beneficial chemicals in aid, which ought also to be obtained and judiciously applied. Chlorine is said to be exceedingly applicable. The great thing to be guarded against is extreme prostration, which stimulants in large quantities can alone overcome. I have seen several cases, and some of them in their several stages—*i. e.*, therestored to health, the incipient disease, the fully developed and advanced cases, and the dying animal. Having seen this, I fear not to assert that every ordinary grazier, and I would almost say every ordinary veterinary practitioner, may be easily mistaken as to the symptoms of the disease. It is undoubtedly a very malignant kind of typhus or typhoid fever; but we have had typhus fevers often enough. The question, therefore, in each case will

be—Is it fever, or is it the cattle plague? I mean to say that it requires a first-class practitioner to decide in its earlier stages; indeed, I believe no one can tell till more developed. It is pretty manifest towards the last; but even then, claimants for compensation under some of these many excellent assurance societies ought to be compelled to obtain a careful examination by a competent practitioner, and receive his certificate as to the true cause of death. Nay, I would go further, and say that if it can be subsequently ascertained that the certificate was given wrongfully, *i. e.*, that it proved to be some analogous disease, but not the real "Cattle Plague," such error or mistake should be fatal, and the claimant must lose his right to compensation. I rejoice much to see the vigour and earnestness displayed in forming these societies. "Many can help the few." They will be great safety-guards, and it would be a gross shame to find them abused. To prevent this, competent members should bestir themselves in every part of every district, and take especial cognizance of each member's herd in that precise locality, so as to be able to inform the Society of any suspicious circumstances relative so it. This would prevent any gross attempts at imposition; and moreover such members might confer with any sufferer as to the best way of disposing of any portion of the herd, in case of attack. For, be it remembered that large sums are raised, and large sums may be required in compensation cases. It is very certain that many fat animals from infected herds are good food for man before they are actually attacked. It would therefore be right to obtain an inspector's certificate of health, and send them to market. This, in all probability, would be a great saving both to the sufferer and the assurance society. These societies, too, should be placed on a sure footing, so that claimants may have a legal right to compensation, and the members be bound to pay such subscriptions as by their rules they engage to do. This can readily be done by inserting a copy of the rules in a book, to which is affixed a proper stamp, and every member signing that book is legally bound to pay accordingly. Besides, he, in addition, may sign a declaration by which he engages to comply with the rules, &c.

It would be superfluous to quote the very many directions and precautions that have been put forth by the Government and professional men. They are to be found in almost every newspaper, so that it is quite unpardonable for any respectable man to remain in ignorance of them, and it would be worse than madness to neglect or discard them. The disease is so dreadful, so destructive, as to be of deep national importance. I think Government ought to insist upon direct information of the outbreak, in any district, or farm, or cow-keepers' sheds, or elsewhere, being communicated to them or their office—say 23, New-street, Spring-gardens, where Professor Simonds presides on behalf of the Government; and let a competent agent be sent at once to investigate the fact, and direct the course to be adopted. At present the arrangements are very unsatisfactory. The magistrates have power, under suspicious circumstances, to appoint an inspector for their respective districts. This inspector must be a duly certificated veterinary surgeon. Now, in my district we have but one duly qualified practitioner within a radius of some fifteen miles extent. This appointment must be thrown open to competent men, who practise the veterinary art,

and that without reference to certificates—the magistrates alone to be the judges of competency. As to compensation, I hold that in the event of a Government officer, who may be called to visit any particular district, finding it necessary to order the destruction of cattle so diseased, in order to prevent its further ravages, that it is the bounden duty of the Government to pay for such cattle. It is for the good of the country, and the country should bear the loss, not the poor grazier individually: he does not introduce or propagate the plague: it is sufficiently trying and grievous to him, without bearing his country's burdens. The disease is unique, the prevention should be the same. Much laudable effort is put forth, but it is not met fairly on behalf of the Government. I hold that the Government ought to render very efficient help to every well-constituted assurance society, and encourage in this way the establishment of more, so that the Government and the country work together. There may be imposition—what of that? It can't go to any great extent. Every society's officer will look after them, as well as Government employés. It is a most momentous case, and

must be met most promptly and unflinchingly. It is not a question of a few thousand pounds, or of a few hundred thousands. It is a question of a country's want—beef or no beef? It's no use "mincing the matter." The whole country may be devastated in a few months: prompt and comprehensive measures are imperatively required, and woe to the country if they are not at once adopted. The assurance societies will not stop it. I have been much engaged in the establishment of one of them. Why, not a tenth of the graziers have yet become members of it! I know it is usual for our British Government to leave these matters to the good sense of the community to rectify and overcome, and very right too. But we are now in especial difficulty, and need more than good advice—we want help. Let the Government declare by Order in Council that they will pay one-half of every compensation awarded by every well-organised assurance society, and great and I think most important results will follow. I know this: it will be of the greatest encouragement to every earnest working man, who, through these societies and otherwise, is trying his utmost to stop the cattle plague.

## THE CATTLE PLAGUE AND ITS ORIGIN.

Mr. John Parkin, M.D., has written a pamphlet on the cattle plague, from which we extract the following:

"We may conclude that the bovine plague now prevailing in England has not been imported from Russia or any other country, and that it is of spontaneous origin. It only remains therefore to consider what cause can be assigned for the outbreak. On the solution of this problem will necessarily depend the measures that ought to be adopted for the prevention of the disease. Hence its importance, not only in a theoretical, but in a practical point of view.

"The first circumstance that demands attention, while entering on this inquiry, is the important fact that we are now living in an epidemic period, characterised by the advent of a new disease—the epidemic cholera; for, although attempts have been made to prove the contrary, no evidence exists of the prevalence of such a disease before 1817. There must therefore be a new cause in operation to have produced this effect; and, as a similar result—viz., the production of a disease, if not new, presenting, at least, peculiar and characteristic symptoms—has occurred in the bovine race, it would not be unphilosophical to infer that both effects are due to one and the self-same cause. We are strengthened in this conclusion by the fact that both diseases made their appearance in Europe in the same locality, viz., in Russia. We have not, it is true, had any account of the existence of murrain in the countries previously invaded by the epidemic cholera, with the exception of Egypt; but this exemption is easily accounted for. In India, and in the countries lying between that part of the world and Russia, very few cattle are kept. A casual death among them, therefore, would hardly be noticed; but it is different where large herds are congregated, and where the mortality would necessarily be in proportion to the number.

"It may be argued, however, that as the disease in the bovine race is different to the cholera, the cause productive of these different affections cannot be the same. To this I would reply, that the primary, remote, exciting cause of the epidemic cholera has not confined its influence to that single disease, but has evidently been productive of other effects, even in the human race. Since the advent of the cholera, another new disease has made its appearance, viz., diphtheria; while all the ordinary diseases, and more especially fever, have been regularly and gradually on the increase in all the countries invaded by this modern scourge. As these different diseases could not have been produced from each other, not only on account of the dissimilarity of the symptoms, but also because they have not prevailed at one and the self-same time; so we must infer, if there be any relation or connexion between them, that they are all due to the operation of one universal and common cause.

"Then, again, it may be said that the cattle disease has not travelled, like the epidemic cholera, regularly, and step by step, from Russia to England, some of the intervening countries having escaped up to the present time. But then it must be remembered that this is not the first murrain we have had since the advent of the cholera. The previous one, termed the lung disease, or pleuro-pneumonia, not only invaded the same countries in Europe as the cholera, but travelled regularly over the same lines from Russia to England. It first appeared in Europe in 1835, but did not reach this country until 1840, and was then confined principally to the thin-skinned and more delicate breeds, as the Devon. It reappeared in 1844, 1845, 1846, and 1847, occasioning great mortality in the latter year. In 1849 also, 20 per cent. of the cattle perished from the same cause, while it was again general in 1851."

After referring to the disease affecting the potatoes and other matters, he says:—

"According to these inferences, the cattle disease, so far from being an accidental occurrence, due to the importation of diseased cattle from Russia, is one of the inevitable consequences of a cause that has been in operation for the last thirty years in Europe.

"Having arrived at this conclusion, the next question that presents itself is, What can this cause be? Unfortunately, this is a question that cannot be answered on the present occasion. In the first place, the majority of medical men conclude that the cause—the remote and essential cause—of epidemic diseases is unknown: while, of those that have a theory, scarcely two are found to agree on the subject. In the next place, having a particular theory of my own, I feel reluctant to refer to it, or to advance a single argument in its favour, on the present occasion, when facts only, and not theories, should be advanced. It will be best therefore to infer, for the moment, that the remote cause of epidemic diseases is still a problem.

"Although unacquainted with the remote cause, there cannot be much doubt with respect to the immediate cause. This is the presence of a deleterious agent in the atmosphere; as it is only on this supposition that we can account for all the phenomena observed at epidemic periods. Not that the poison is generated in the atmosphere: the effects produced are too limited in their range to admit of such an explanation. Observing this limitation, we can only infer that the agent is derived from some other source—one with which only a portion of the atmosphere comes in contact. Finding also, that the poison is more concentrated at lower than at higher altitudes—epidemic diseases prevailing to a greater extent in the former than in the latter situation—we may also conclude that the poison is extricated from the surface of the

th, along particular lines, and in certain spots of greater or less extent. These inferences granted, we may then understand the *rationale* of the measures about to be recommended: the prevention of the cattle plague."

As to "PREVENTION," he says: "When the epidemic is prevailing in the neighbourhood, and more particularly if it is broken out among the herd, they should be kept under shelter as much as possible during the day, and entirely so at night. Experience has shown that individuals exposed to the night air, during epidemic periods, are more liable to attacks than others. The reason, as we may infer, is, that the poison conducive of all diseases, the same as that well-known substance called malaria, possesses a specific gravity greater than that of atmospheric air. Becoming rarified by the warmth of the sun, it rises into the higher regions of the air during the day, but again falls to the earth, when its rays are withdrawn."

"Although present in the atmosphere, the poison, as previously remarked, is not equally diffused in this fluid; it is in a state of greater concentration in one situation than in another. Hence it is that those living near the source of the infection of the poison become affected, while those at a distance escape; the poison, by its diffusion and dilution in the surrounding air, becoming innocuous beyond certain limits—hence the limitation of range of epidemic diseases. The fact is still more apparent with endemic diseases; for we not only now the source whence the poison (malaria) is extricated, but the extent of its range. The source is all low, marshy, and alluvial soils, so that higher grounds are either partially, or entirely, exempted from its deleterious influences. Thus it is, that, in tropical climates, the severest form of fever—the continued—will be found on the plains below; remittent, on the heights above; and intermittent—the mildest form of all—at all greater elevations. We do not find the same limitation of range with epidemics; the epidemic cholera having been met with at the highest inhabited ranges of the Himalaya mountains—10,000 feet above the level of the sea. Still, their prevalence is less, and the limitation of their range is much greater, and more defined, at high than at low elevations. Geological formations have, also, some considerable influence, as regards the prevalence of disease. Hence I have laid it down as a law, regulating the march of epidemic diseases, that they prevail to the greatest extent in alluvial and tertiary formations, less so on secondary formations, and least of all on primary rocks."

"Whenever, therefore, disease breaks out among a herd of cattle, placed in low and marshy ground, they should, if possible, and if not in contravention to the orders of the Privy Council, be removed to higher ground—more particularly where there are animals, in the latter situation, among whom no disease has manifested itself."

"There is another rule that may also be adopted. It has been stated that the range of epidemic diseases is frequently very limited in a town; they are equally so in other situations. For instance, it has frequently happened, in India, that two corps on marching together, have encamped for the night on separate ground, but near to each other. The one has been immediately attacked with cholera; the other has not presented a single case. Observing this, the sick corps changes its encampment, and takes up a position alongside the healthy one. This is no sooner done than the disease ceases; the healthy corps also remaining unaffected, although the sick and the dying were removed at the same time. When, therefore, it is impossible to remove the cattle to a more elevated situation, another grazing ground, even at the same elevation, may be tried—more particularly if the test mentioned above can be obtained. There is no fear of the healthy cattle being infected by the sickly herd; the example just given will show us. The disease may, of course, break out in this locality, the same as others; but, then, this would have occurred even if the sick cattle had not been removed there. As, however, such a step would be contrary to the regulations at present in force, it will be necessary to remove the healthy cattle to another locality, previously to the removal of the sick herd."

"But all cattle are not kept in grazing ground; there are some, and more particularly dairy cows, in London and other large towns, which are stall-fed. The regulations that I should propose for these are the following:

"Do not admit more air than what seems absolutely necessary for the purposes of respiration; and let that air be admitted, to

use a nautical phrase, on the *lee*, not on the windward side of the cow-house. It but too often happens during the prevalence of epidemic diseases, that we are induced to exclaim with the poet:

"The Angel of Death rode by on the blast,  
And smote in the face of the foe as he pass'd."

All the windows and doors, however, may be thrown open, and the place be properly ventilated for an hour or two, in the middle of the day, more particularly in warm weather, as, for the reasons previously given, there is less danger at that time than any other. It is the night air that is most to be dreaded.

"These are the only general measures that I should propose for the prevention of the disease: but we must not rest contented with these. There is another, more certain, and more specific method, that I should strongly advise the proprietors of cattle to adopt, whenever the disease is prevailing in the locality or in the neighbourhood. This is by the employment of one of the different forms of carbon, as recommended more particularly for the treatment of the disease. My faith in the efficacy of these agents is so great, that I have no hesitation in affirming they would, if properly administered and in sufficient quantity, preserve an animal from an attack, even in an infected atmosphere. To obtain such a result is of no slight importance at the present moment, when the proprietors of stock are recommended to slay their animals on the first outbreak of the disease—sick and healthy alike."

"Believing this step to be most prejudicial to the interests of the proprietors of stock, and injurious to the welfare of all classes, I cannot close these remarks without entering my solemn protest against this bovidical mania—if I may be allowed to coin a word. A Professor remarks, in a letter inserted in one of the journals: 'It is highly necessary to inform the public that the present scourge, unlike cholera and similar human diseases, has no tendency to die out, after a brief period of its extension. So long as living cattle are within reach of anything infected or diseased, so long must it go on; and it is chiefly by wholesale extermination of stock, that the last embers of the disorder will be consumed.' These conclusions, as must be evident from what has gone before, are not only unsound and erroneous, but they are prejudicial in the highest degree to the interest alike of the public and of the holders of stock. Not only is the cattle plague a true epidemic, but, what is more, it will subside after a time of its own accord, even if all the healthy and all the sick were mixed promiscuously together. If the disease be neither contagious nor infectious, it will be both a crime and a sin to slay a single animal that has been attacked, for as long as there is life there is hope. Besides, if this wholesale extermination of stock is to be carried out, whence are we to obtain a fresh supply; Russia has already had 100,000 head of cattle carried off, and although other countries in Europe have hitherto escaped, this immunity will not always continue. They also will be brought, sooner or later, under the malign influence of the same cause, as will also America, although not a single animal be transported thither from Europe. I would therefore say to the proprietors of stock, Use your best endeavours to prevent the disease; should these means fail, and some of your animals be attacked, think only of how they can best be cured; so that, if they die, the verdict may be: 'Died by the visitation of God': not 'by the hand of man.'"

TREATMENT: As to the treatment of the cattle, Mr. Parkin says: "Although Professor Simonds tells us, in his Report to the Privy Council, that 'the experience gained in this country confirms Europe, as a whole—viz., whenever the plague breaks from its strongholds in Russia, and invades other countries, medical skill is powerless in arresting its progress by the application of curative measures,' I am ready to maintain the contrary. As the organization of man and of animals is the same, and as the diseases are nearly identical, there is no reason why the cattle plague should not be as amenable to treatment as typhus or typhoid fever in the human race. If such a result has not been obtained at present, it must be ascribed to the fact that the proper treatment and the proper remedies have not been hitherto employed. Convinced of the truth of this conclusion, I am induced to propose the following method of treatment, not only because I have found it to be the most efficacious in human subjects, but also from the fact that it has been adopted with success, both by myself and by others, in the brute creation—in the murrain that prevailed

some years since in England. This is by the employment of the different forms of carbon.

"As the gaseous form is that on which the greatest reliance is to be placed, I will first point out the best mode of its administration. As long as the animal takes its drink regularly and in the usual quantity, the gas may be diffused in the water, which can be easily effected by dissolving one drachm and a-half of bi-carbonate of soda and one drachm of tartaric acid in each pailful of water. If, however, the animal refuses its drink or takes it in less quantity than usual, the gaseous fluid must be poured down the patient's throat, or it may be given by enema. In this case, a smaller quantity of fluid should, of course, be employed; while, if an injection be resorted to, the water must be warm—98 deg. Fahrenheit, or blood-heat. One very good method of administering the gas by the mouth is, to pour a bottle of soda-water down the animal's throat, care being taken to prevent the escape of the gas. This should be repeated every two or three hours, until the urgent symptoms are relieved. If more convenient, yeast—brewer's yeast—may be substituted for the soda-water, or it may be given in combination with it. In the former case, half-a-pint may be given every three or four hours; in the latter, half that quantity. If a stimulant be required, as is the case in the latter stages of the disease, instead of the soda-

water, a bottle of porter, or ale, if old and well up, may be employed instead.

"In addition to the above, one of the other forms of carbon should be resorted to; and as we are only acquainted with carbon in its pure form in the diamond, we must employ those compounds in which it exists in the largest proportions, viz. in the hydro-carbons. The best is naphtha, which contains 81 per cent. of carbon. Two teaspoonfuls of this—the pure, medicinal naphtha—may be given every four hours, in mint or chamomile tea, and be continued until the subsidence of the specific symptoms—those characteristic of the disease. When the naphtha cannot be obtained, a tablespoonful of cod liver or olive oil may be substituted for it.

"As the object of this mode of treatment is to remove the cause rather than to remedy the effects, it should be resorted to at the earliest possible period of the attack. For the removal of the effects—the debility, &c.—the ordinary method must be resorted to. I must, however, enter my protest against the employment of stimulants, excepting as a last resource, and in the last stage of the disease. The debility experienced at the commencement of the attack is merely the effect of the impression of the morbid agent on the system, and will disappear, in common with the other effects at that stage of the disease, on the removal of the operating cause."

## CAUSES OF THE CATTLE PLAGUE.

SIR,—I am obliged for the insertion of my last letter on this subject, in which I attempted to show that the British modes of stock management were far more congenial to health than the foreign. At the same time it may be useful to enter a little more fully into the subject, just to see whether we do err materially, and, if we do, in what way our errors could be corrected.

Now, in examining the agricultural modes, I come to the conclusion that, in the country, we may err a little in economy, but that as regards the health of our animals we cannot greatly improve upon our plans. For instance, our cattle are kept during summer in the pastures, and are fattened during winter on roots, hay, cake, and corn; the greater portion of the stock being fattened in yards with open sheds attached. Now, here we have the cattle fed on green food and in the open air all the year. A small proportion are no doubt more closely kept, in boxes, stalls, covered yards, or on boards. But none are kept so unnaturally and unwholesomely as the dairy cattle in London—kept in close stables, or even in cellars, and fed on grains and distillers' waste; and, in Edinburgh, on sewage-grown grass, the result being a large product of very thin milk, produced at the cost of loss of health or even life to the cow, and perhaps to the injury of the consumer who uses milk from animals suffering from incipient lung disease, and in which the flow of milk is induced to an extent that may almost be considered a disease.

For sheep, our English custom is that of outdoor feeding; those few who have tried shed-feeding on the board system having left it off.

For pigs, we have the animals at grass or clover, or at "stack," while in a store state, or kept in open yards in winter on beef and beans; and then for fattening, barley meal with the house wash, and, when it can be obtained, skim milk. Is not this English system conducive to health in the animal and in the eater? Is there any comparison to be made between it and the foreign mode, where the swine-herd blows his horn to bring his gaunt animals to their mast and acorns? or to the Irish, where measles is developed in the animal by its residing in the cabin and feeding on potatoes? So far as the feeding is concerned, the Londoner cannot have more wholesome food than country pork and country sausages. Though he may well shun the garbage and graves-fed pork of London, and abstain from London-made sausages, whether of beef or pork.

As to fowls—the country fowl, bred in the open air, at the barn-door, in the stackyard, or in the yards, and finished by a few weeks' fattening on wholesome corn, must possess a flavour, a firmness, a nourishing wholesomeness, far superior to those cooped up with their own excrement, and crammed with grease and other nauseous mixtures.

The country modes are, in short, adapted to induce health in the animal, and to produce wholesome food for the consumer. They err against economy in a few minor matters—as, for instance, in feeding animals on such luxuriant grass as we now possess, or on turnips of too rapid growth, and, consequently, run to rapid decay: we ought to supply considerable quantities of dry food; and for sheep and cattle a constant supply of rock salt, to promote digestion and to correct any ill effects from too great luxuriance.

With plenty of dry food and salt, I am convinced we should hear little of the injurious effects of turnips on sheep, especially those grown with artificial manures. We often hear the complaint that we cannot grow so good turnips as our fathers, and that the new-fangled manures render them unwholesome. But is not the reason this—that our fathers grew turnips on new land and as a new thing, while our four-course system has made the soil sick of turnips. And artificial manures are injurious when applied on poor land which has not staple sufficient to carry on the luxuriant growth which the artificials have excited. On good land, or with the addition of plenty of farm-yard manure to carry on the growth, the results of artificials must be good.

We are apt to forget the original nature of our animals, to feed them too monotonously. If we put our sheep into a few pieces of turnips, it is enough. But the sheep is an animal that feeds on thriving downs and heathy mountains, and requires something to correct the turnip, which, the more luxuriant and the more free from weeds they may be, the more suitable are they for such an animal. Our pigs we fatten on pure barley meal and pea meal: we forget that the pig in his native state is omnivorous, that he is constantly on the lookout for grubs and larvae, and no doubt swallows large quantities of earth, which cures acidity and prevents eruptions. Therefore a small proportion of graves would be a useful addition, and, as Mr. Stearn suggests, a few coals or cinders for him to crunch, the sulphur or carbon, of which coals consist, being very conducive to health. For fowls, again—they, being natives of tropical countries, require warm and dry lodgings: their food in their native state consisting of berries and insects, some small proportion of animal food must be useful where they have not a spacious run, and a mixture of something hot and condimental would be useful, especially in damp weather, to keep them in health.

Thus I have passed our British modes of feeding and fattening in review, without discovering anything that could cause the disease. Everything points to a foreign source. Alarmists have feared that pigs and poultry were suffering under similar diseases; but of this we have no proof, and it is probable that the complaint in fowls is the common pip.

For remedies—there are *plenty* and there are *none*; that is, there are none certain: we must look to preventives. I see many persons have recommended their peculiar manufactures, and no doubt all tonics are useful in supplying stamina. But probably a plentiful supply of salt would be as useful as any: we know how cattle flock to the salt-licks of America. Anything antiseptic or anti-fermentative would be of use, probably, in checking the progress of a disease which may owe its virulence to an undue predominance of ferment in the blood. Thus a small quantity of sulphuric acid in the water should be given, sulphur being a great enemy to all fermentation, and the acid the most powerful deodorizer we have. I might also urge the trial, as a preventive, of very homoeopathic doses of arsenic—do not be frightened. A Mr. Bonar in his travels

in Bavaria discovered that arsenic cakes were numerous there, and that they who partook of them were plump, clear-skinned, and more able to withstand fatigue than others. The system might by that means be imbued with a substance that should render it impervious to disease of this nature. Inoculation, it is said, gives immunity from attack. Now, why should not our scientific men discover some substance which should act on the tissues in the same way as inoculation, and thus operate as a similar preservative? W. R.

Sept. 23.

[We give our correspondent's letter on the principle of hearing both sides of the question, although we by no means agree with the deduction he arrives at. There are many things in England that would tend to cause disease.—EDITOR.]

## THE CATTLE PLAGUE.

BY DR. MASCH,

Veterinary Professor at the Agricultural College at Altenburg, Hungary.

Within the last year the scourge of the rinderpest has caused ravages among the cattle to an enormous extent, chiefly in the eastern crown-lands. Even now its fatal influence is still manifest; and although the last case in the inland may be a thing of the past, the danger for the future is nevertheless not lessened; far in the distant east there perpetually arise, from a mysterious source, life-threatening agencies, which, once developed, travelling in all directions, may also reach the byres and droves of cattle here.

If the rinderpest and the cholera are compared with each other, then they agree in the destructive influence which they exercise on those living organisms over which their power extends; they agree also in the fact that they defeat every medical enterprise which is directed against them as a curative means; but in other respects the two diseases differ. Whilst the horrible spectre of cholera, when it visits city and hamlet, stalks on paths undiscoverable, or at least undiscovered, the way in which the rinderpest spreads lies more open. A combustible substance will be set on fire by one, burning with the more certainty the more closely it comes in contact with the flame and the heat of the latter. Thus, among sound cattle of a byre or drove, every diseased one is to be looked upon as a burning, glowing, flaming body; and every other animal near it as a combustible body. This comparison is correct; and should, in its extensive application, be a guide to every intelligent farmer in order to avail himself in time of danger of the right means of ensuring the safety of the cattle. The writer of this believes most firmly that cattle can be protected against the rinderpest more successfully than a house against fire.

With this conviction we appeal to the breeders, feeders, and dealers in cattle; and for the protection which we most confidently promise them, we demand an attentive ear for our advice, and, if it is necessary, a rigid carrying out of it. We must however, first of all, give some explanations of the capabilities of infection of the plague in question.

That the rinderpest is contagious may be expressed in this way: The material parts and particles of diseased cattle, whether they be solid, liquid, or gaseous—whether they be among themselves in organic combination or departing from the organism, or already departed—all are in a peculiar condition, departing from the normal one, just as the state of a ball when heated departs from the state in which it is when reduced to a lower temperature. The peculiarity of this state is equivalent with its power of infecting, and this results in the fact that material particles of diseased cattle when transferred to a sound one, and penetrating the barrier of a thin epidermis, change in a few days the whole of the latter, so that it is likewise capable of infecting. It acts as a ferment. It must be looked upon as an established fact that cattle in our countries never develop rinderpest otherwise than by receiving particles of matter from individuals of their species already fallen victims to the disease. It is, however, just as certain that cattle cannot be placed in a state of safety except by a protection which involves a complete shutting out from sound cattle

those minute particles of matter called contagious matter. He deceives himself, and makes a tremendous mistake, who, neglecting the only means by which he may protect his cattle, seeks the safety of his animals from infection by bleeding, lotions, injections, in secret and traditional popular remedies; and who, in false confidence in these things, does not minutely observe the care necessary for the prevention of infection; and who, perhaps, disregards the sanitary rules altogether, or carries them out but very imperfectly. This is the more unpardonable, because in such a case the imprudence of a single individual endangers the material well-being of a whole community. It shows, however, also the stubbornness and blindness of those people who, actually knowing that, in the midst of diseased places and districts, the cattle of those proprietors are not damaged who, for the prevention of disease, carry out an isolation which goes too far, but which is certainly effective; and who, seeing this occasionally, do not yet understand how to avail themselves of so beneficial an example for the protection of their own cattle. The writer of this essay has met with ridiculous views and habits in this department, especially among small proprietors (Bauern), over-wise empirics, and clergymen who carry on farming. The class last named weigh the more heavily in the scale of public injury—the more the example of the shepherd determines the conduct of the flock. People generally dread the small inconvenience of the moment, and remain indifferent towards the threatening disasters of the future: they are afraid of the application of a salutary remedy, and neglect the saving operation; and at last they accuse the State, the public administration, the sanitary organs, and demand compensation for the damage which they did not feel inclined to avert. We, however, stick to our proposition; and understand by prevention of rinderpest neither more nor less than separation of diseased from sound cattle. If it is asserted that for infection direct contact between healthy and diseased substance is necessary, then this is literally true. But by "contact" we should not only understand the meeting of a tangibly solid or liquid particle of the diseased substance on the one hand, and the living healthy organism on the other, but for infection the meeting even is sufficient of such diseased particles as, on account of their gaseous nature, remain imperceptible alike to the sense of taste and touch. Every living organism, and even a dead body, is perpetually surrounded by vapour, the material parts of which escape in all directions; which, however, remain permanent through additional elimination of particles from the tangible substance. A diseased animal lives likewise in its own atmosphere, and forms as it were the centre of it. This atmosphere, as regards its material part, is composed of particles which, endowed with the power of infection, escape from the diseased body, and are carried away, however short the distance and however brief the time may be. This contagious atmosphere must particularly be paid attention to, because it is invisible, and therefore often ignored altogether. Of equal importance and effect are also the breath, the gaseous evacuation of the intestines, as well as the effluvia which escape from the excrements of the



intestines, the urine, the milk, the blood, flesh, saliva, lachrymal fluid, skin, and other parts of the diseased organism, either during life or after death.

Whether there is more contagious force in the gaseous, the liquid, or the solid animal particles, is of no importance for the farmer to know; and it is more beneficial to him, as it corresponds more with reality, to consider them all equally dangerous.

Although it is not to be denied that the contagious force dwells in a more concentrated form and more permanently in solid and liquid matter than in gaseous nevertheless the latter penetrates more easily into the more delicate structures of the organism, since there lies exposed to it the convenient way in the large extent of the mucous membrane of the respiratory organs. Gaseous and liquid contagious matter can be longer preserved by mediums, viz., bodies of various kinds to which they attach themselves; and when removed from their place of origin they may still be capable of showing themselves effective. Porous substances, such as furs, woollen articles, and linen tissue, are, on account of their immense surface, capable of receiving and condensing gaseous contagious matter, and of carrying them to great distances. They are, on that account, very properly called "poison-catching materials." Contagious matter in a liquid shape does not retain its poisonous properties so very long as when it is attached to mediums which favour its becoming dry, but do not accelerate decomposition. Of this sort are especially dry substances of vegetable and animal origin.

As very dangerous mediums of conveying the rinderpest in cases where the disease appears in the neighbourhood, men must be so considered, and besides them half-free domestic animals such as dogs and cats. Men may be the more suspected of carrying the disease the more they have to do with cattle by occupation and trade, and not with cattle only, but also with the offal and useful parts of the animals. Cattle-dealers, butchers, &c., and also drovers, are dangerous; and so, too, are veterinary surgeons, and especially those who, without being qualified, engage in veterinary occupations. Dogs and cats, as well as even the fowls of large farms, come too often in contact with cattle and their offal, either in the society of men or otherwise, to be regarded with indifference.

There is one class of carriers of contagious matter less known and less mentioned, which we will notice here especially. These are the *flies*. These creatures, moveable, unsteady, and unnoticed as a means of spreading rinderpest, are possibly capable of multiplying cases of rinderpest greatly, by conveying contagious matter even to those cattle that appear to be completely removed beyond danger. If flies are even to healthy cattle most obtrusive parasites, they are such to a much greater extent to exhausted diseased cattle. They seek, with a special preference, food at the margin of those apertures of the body that are provided with but a very delicate skin, whilst others plunge their suckers into the skin to suck blood; both kinds, when driven from one animal, alight on others, dwelling more or less near, and spread the plague by means of their poison-carrying sucking apparatus to great distances. We are unable to refer the rapid and extensive spreading of the plague in summer and autumn to any other cause than the multitude and activity of the two-winged insects at those seasons. This means of infection has certainly some connection with the custom which prevails among some cattle breeders of smearing tar over the surrounding parts of the eyes, the margin of the nostrils, and the mouth, expecting from it protection against the disease. We do not hesitate for a moment to recommend at the fly season and at an approaching danger of the plague an application, occasionally, of such fatty substances as are mixed up with oil of turpentine, tar, or crocoote, on the parts of the body mentioned above. It should however, not be done in order to supersede other means of safety, but merely to keep off these dangerous flies. The most effective, surest, and the most common carriers of the rinderpest are diseased cattle themselves. They act by means of their breath, their atmosphere of evaporation, the surface of their tangible body, as well as by means of everything solid and liquid which arises from their organism, and with the more certainty the more closely and longer sound animals are in this way brought into contact. This becomes especially conspicuous in byres where among animals standing in rows the plague commences with one; the one that stands next to it is generally the next to get the disease and die.

It is pretty generally known that an infected animal does

not show the symptoms of the disease on the very first day it was infected; this requires a period of incubation of at least five days. After this period the system shows first the progress of a power that has crept through the whole organized structure of the body, and threatens its existence. It reveals at once by external symptoms, departing from the healthy processes of life, the existence of internal dangers. From this period the symptoms of disease increase in the same degree as the contagious force spreads in the system, and extends over many days as are required for incubation. The disturbed system very seldom succeeds in disinfecting itself by the mysterious of its own vital energies, whilst at the same time the symptoms of the disease subside; in most cases the efforts of the living body, which are directed against its dissolution, are not sufficient to avert the fatal results of infection. A small percentage of diseased cattle recover; yet this recovery is a complete one when compared with another calamity among cattle—pleuro-pneumonia. If the cattle of Eastern Europe are compared with those of Western Europe as regards the rate of mortality in consequence of the rinderpest, it will show that the former generally possess but little power of resistance against the fatal issue, and yet the power of resistance is decidedly greater among them than among the latter. Out of one hundred diseased cattle scarcely five escape death. Organisms, which have received the contagious matter, acquire the capacity of infecting not only at the time when the disease appears, but from this period till the animal dies it is perpetually increasing. However, for twelve hours after the appearance of the first symptoms the capacity for developing contagious matter is but very small. Sound cattle are during this time, according to the opinion of the writer and the experience of others, by no means endangered. This circumstance is of the utmost importance for the prevention of the spreading of the rinderpest; and, whatever may be said to the breeders of cattle with reference to battling with this calamity, it is true that the speediest separation of diseased from sound cattle is still the most practical and most successful procedure. If a row of houses built of wood fire breaks out in one of them, then the other buildings can be saved if the burning one is immediately removed to a place the neighbourhood of which is fire-safe.

If in every place where rinderpest is approaching, every animal that shows itself diseased is without delay removed to a safe place and made safe for others, then something of the most effective kind would have been done for the limitation of its spreading; the rinderpest would be extinguished from sheer want of food, after the very first sacrifice, and the plague, although a very rude but at the same time an indispensable means, would get out of use in its application to diseased and suspected animals. One must have respect for the utility of all sanitary rules for the suppression of rinderpest; but carrying out these generally succeeds but very slowly, even under the most favourable circumstances, and encounters on that very account as opponent which has become already great and powerful, and is only with difficulty conquered even by costly means. In consequence of the watchful care on the part of the cattle proprietors, by means of which they discover quickly which are diseased cattle, and at once remove the diseased from the sound, the battling against the cattle plague should be considerably facilitated on the part of the public sanitary authorities, and the majority of innocent victims.

From what has been said, the assumption may be justified that the protection effected by the separation of diseased from sound cattle surpasses in efficiency every other practical procedure devised for the suppression of the rinderpest.

This protection would, however, be illusory, and its proclamation premature, if the separation, so much recommended, is not carried out at the right time.

The chief question is—What period is the right one for separation? Whereupon we answer conclusively, The sooner the better. The sooner the disease is discovered the better; the more immediate the subsequent separation the more certainly is the danger of the spread of rinderpest obviated. The disease of the rinderpest announces itself at the beginning by no other symptoms than those which appear also in other febrile diseases involving the whole organism in their very origin. These are just phenomena common to all febrile cattle diseases—as, for instance, diminished appetite, irregular mastication, low spirits, want of vitality, muscular weakness, relaxed condition of the whole body, the head, the ears, and the tail.

The practised eye of the breeder recognizes easily these external signs by the inspection of his cattle, and diagnoses from it the first indistinct outlines of an ensuing diseased spectacle. In ordinary times he avails himself only of but ordinary means, and abandons himself perhaps to the hope that it is with such signs as with ordinary thunderclouds, which tower at noon in a threatening manner, and evaporate in the evening without a trace, and without culminating in a thunderstorm. But at a time when the cattle plague is threatening, then the cattle-breeder should get every suspected animal out of the reach of the rest, and avail himself of all further precautions, after he has carried out the first and most important—that of separation. One should in such cases not fear that the approaching evil is the rinderpest, but one should fear that it might be the rinderpest; one should not abstain from trading from want of proof, but one should trade on mere suspicion; he who waits for certainty is too late. One should not object to the writer, that in this way cattle-breeders are kept in perpetual apprehension, and induced to make many provisions which are, after all, superfluous. Reproaches of this kind can only emanate from those who have not themselves perceived the bitter after-taste of the rinderpest. He who has been once injured by it will, on a new occasion, inevitably carry out the separation of every animal only suspected; and if in ten cases the suspicion has proved groundless, in the eleventh case, nevertheless, the separation should be hurried on.

In no other place are the sanitary rules in regard to the rinderpest carried out with so much circumspection and success as was done in the years 1862 and 1863 in the district of Altenburg, in Hungary, which is so rich in cattle-farms. Whilst the disease lasted, every head of cattle which manifested indisposition was, after the very first symptoms, immediately removed from the byres to a place of inspection. In this manner many animals have been conveyed to the places of inspection, and removed afterwards to their former abode when their soundness had been sufficiently established. Caution has, nevertheless, not been diminished. On the 24th November, 1862, an ox in a large byre evinced signs of indisposition, very indistinct and scarcely perceptible. This ox, however, was removed half-an-hour afterwards in consequence of the existing strict rules; and since his indisposition was aggravated, it was made known to the authorities, in accordance to sanitary laws. A commission of practical men discovered in this ox, five days after his disease, the symptoms of the rinderpest so distinctly developed that even without the addition of the proofs derived from a section, the former alone would have sufficiently established the existence of a case of rinderpest. The other oxen remained sound.

This case, and other illustrations, will, it is to be hoped, place the significance and usefulness of separation in a right light, and justify the author if he speaks on it with a determination to convince the cattle-breeders of his country.—*Translated by Herr H. Kunde, Edinburgh, for "N. B. Agriculturist."*

## A CURE FOR THE CATTLE PEST.

The following table of cattle cured, with the names of the cowkeepers and farmers to whom they belonged, are furnished by Dr. Browne, a retired army-surgeon, who has had great experience in fevers and cholera in the hot climate of India. Since the outbreak of this cattle pest he has given almost his whole attention to the subject, although he has not stopped to inquire whence the disease originated, but has the rather taken the animals as they were found, some dead, some dying, and others showing symptoms of the first stage of the disease. Dr. Browne's opinion, however, from the first, has been that the disease was indigenous, and only developed by some extraordinary conditions under which the animals were placed as regards the weather, their food, and the confinement in which they had lived. This quite agrees with the views of Clayter, the observant and reflective veterinarian who wrote of the "plague" of the last century. This latter authority says it is always present among us, and was brought to the state of a "plague" by extraordinary conditions similar to the above.

Of the living animals enumerated below, we may say that we had the satisfaction yesterday of seeing them, not only in a recovered state of health, but in restored condition, and giving for the most part a full supply of milk. It will perhaps be wondered how it was that Dr. Browne could, under the orders issued by the Privy Council, get animals to experiment upon; but the simple answer to this is, Miss Burdett Coutts, after losing her herd, applied to the Privy Council for leave to have the trial of curing some made, the expense of which experiment she would bear. Thus the following evidence of one step having been taken in the right direction is due to the sagacity and liberality of a lady whose name has long been connected with good works. Her expressed motive was to avert in some measure the impending ruin of small cow-keepers, whose livelihood might depend altogether on the health of a few cows. Miss Coutts placed this concession on the part of the Privy Council in the hands of her physician, Dr. Forshall, who has witnessed the effect of Dr. Browne's treatment in the cases of Mr. Cotton's and Mr. Bateman's cows.

Many of the cows, as it is well known, of these herds died off in the first instance without the chance of the recovery of one of them. Now Dr. Browne says he has no doubt about curing at least 90 per cent., and if the first symptoms were at once detected by hourly inspection, a greater per-centage than that could be saved. The great difficulty in which Dr. Browne is now placed is that of being unable to get animals to

cure. If this be true, and our observations go to confirm it, what a blot this pole-axing and stamping-out remedy will be on all who have had in it a guiding and governing hand!

Mr. Alderman Sidney had a cow which last week threatened to fall into a state of collapse. Dr. Browne pointed out the symptoms to the Alderman and administered his remedy. The cow yesterday was sleek and apparently perfectly restored. A young bull of Mr. Bateman's had been under other treatment, and was about to die, when Dr. Browne gave it a powerful dose, and it is now alive and sleek, although there are yet signs of the great shock to which his system has been subjected. Mr. Cotton has a cow which had not the remedy applied for three days after being attacked. Yesterday, at the end of the sixth day, she was alive, and although apparently very bad, she had not got beyond the second stage, and Dr. Browne was confident of her ultimate recovery, as she had lived so long under such disadvantages. Another had fallen off her feed; but she was taken in time, and no symptoms of running eyes and nose or staring coat had yet come on, while the sensitiveness along the spinal ridge had departed. There are some other observations that we have to consider and relate, but these we will defer till we have had a second opportunity of witnessing the result of the treatment in question. The following table of facts and notes on symptoms Dr. Browne wrote out at our request. Many of those cured cows we saw, one lot of 17 all looking well and chewing their cud. Mr. Cotton had about the same number remaining. According to the theory of "eminent" veterinary advisers, the whole of these fine, and many of them beautiful cows, ought now to have been mingled with quick lime six feet deep in the earth!! Dr. Browne, whose address is Green Lanes, Hornsey, N., says:—

I observe that the cattle plague exhibits in its course three stages or phases:

1st stage. It manifests itself by a watery glassy appearance of the sclerotic coat of the eye, with fulness of the superficial vessels; the vertebral column is tender on pressure, especially about the dorsal region; the coat is dull, and on the summit of the spinal ridge the capillae are elevated; pulse slower than natural, and irregular.

2nd stage. Pulse possesses a thrilling sensation, with irregular action; the capillae are rough, dry and staring; the nostrils and mouth are covered with exudation; there is a drooping of the head; the ears are below their natural temperature; there is evidently much pain in the head and back;

the urine is scarce, and milk almost or totally deficient; a pungent and peculiarly nauseating odour escapes from the animal, and there is some amount of purging; the mouth may have a few slight patches of ulceration; breathing apparently oppressed; on applying the ear to the chest crepitation may be more or less present; the animal occasionally moans.

3rd stage. Constant moaning; pulse small, irregular, and intermittent; frequent purging of most offensive dejecta; the nostrils exude purulent secretæ, and from the mouth frothy mucus keeps dropping; the animal is below the ordinary temperature; there are frequent tremors of limb and muscle; there is rapid and excessive wasting; the evacuation has a colour of muddy water, and aqueous in character; there is an inflamed look of the mucous lining of the terminal passages, with blood sometimes passing; great weakness; breathing hard, difficult, short, and laboured; pulse gets more feeble, moaning more persistent, and effluvia from body more pungent. The senses remain clear to the last, when the animal, after enduring many hours' suffering, dies, after a few efforts to rise.

Such are the distinctive physical external characteristics of this disease. And as I find that the sensoria are intact, that there is a total absence of sordes or furring about the mouth or teeth, that shiverings are absent, that the skin is from the first stage below par equally with the pulse, I cannot, therefore, attribute the malady to what is called typhus.

For the foregoing reasons I can only conclude that it is essentially what is conventionally termed "pest," being closely allied to the severer forms of cholera among the human species, for when the disease is apparent in the animal a period of collapse has set in. That the disease is capable of easy arrestation in the first stage is now most satisfactorily established—so much so, that a fatal result will be the exception.

# CASES OF RINDERPEST TREATED BY DR. J. COLLIS BROWNE, FROM JULY TO OCTOBER, 1885.

Name.	Residence.	Treated.		Total.	Died.	Cured, or subsequently sold.	Actually remaining.	Date.
		At Farm.	In Dairy.					
Mr. Mills .....	Roman Road, Islington	7	23	30	9	21	15	
Mr. Jordan .....	Newington .....	18	35	53	13	40	30	
Mr. Palmer .....	Hornsey .....	5	—	5	—	5	—	
Mrs. Nichols .....	Liverpool Rd., Islington	—	7	7	2	4	4	
Mr. Bateman .....	Finchley .....	5	—	5	—	5	5	
Aldn. Sidney .....	Southgate .....	1	—	1	—	1	1	
		36	65	101	24	76	6	

\* One died from Exposure.

J. COLLIS BROWNE.

Whatever may be the ultimate result of this treatment, surely Dr. Browne ought to be called to give evidence of the result of his practice before the Commission just appointed. Now we have the malady in our midst, its cure is of the first importance, and its origin a mere after-matter for consideration. W. W. G.

[It appears that Dr. Browne did not furnish our correspondent with his recipe, but of course this may be had in the way of business.—Ed.]

## COMSTOCK'S SPADER ON THE FARM OF MR. SULLIVANT.

Army correspondents delighted in saying that the head quarters of a certain well-known general were in the saddle. The head quarters of Comstock's rotary spaders are well established in strong position in the field at "Broadlands." Though a simultaneous movement is being made along the whole line, and blows are being struck at some twenty different points, there is the great central position where the greatest results have been expected, because of superior force and the great amount to be accomplished.

To give a better idea of this whole matter, it may be well to state that the farm of Mr. Sullivan embraces a tract of about twenty thousand acres, consisting, for the most part, of high rolling prairie land, entirely within what has very appropriately been termed the great "corn zone" of Illinois. It is without doubt the largest tract of land legitimately farmed in the United States, or perhaps in the world, by one individual; we say legitimate farming, because here everything is carried from one central point, where all the hands are fed and lodged, and from whence they depart to their daily toil. Instead of the system of tenants working their allotted sections, as is generally the case with large landholders, one master-mind controls and directs all here, subordinates counselling and carrying out plans for the season, the week, and the day. When it is considered that "help" here is counted by the score, acres of corn, the great crop of the farm, by the thousand, oats and other small grain by the hundred acres, pasture and meadow lands reckoned by the section, and the hay crop by the hundred tons, that the fencing counts well up towards a hundred miles, and all else in proportion, it will be seen at a glance that everything must be conducted with system and regularity: there must be few loose ends. Such is the case here. Such a system of accounts has been adopted as shows the proprietor at a glance at the close of the year not only what it has cost to raise a certain crop, but what each part of the labour upon a certain crop has cost, so that to that portion which relatively is the most expensive, attention may be directed to its cheapening. For instance, if ploughing is found to cost more than any other part of corn growing, it is of course at once decided to inquire into and encourage all efforts at improvement in ploughs or their equivalent. The same is the case in all

the departments of labour upon the farm. The latest and the best farm machinery is always in demand here, and it is so wise counted a loss to cast aside even expensive machinery when an improved substitute is at hand; and while a visitor may be astonished at the immense collection of used up, discarded, superseded implements, a little reflection shows him that they have accomplished a useful purpose, have caused but a comparatively trifling loss, as they have simply given place to better.

Now it is a fact that in the culture of our corn and other common crops the work of the plough is fundamental. Its workings are slow and tedious, requiring hard labour from both man and beast. The fitting of land for the growth of the common cereals, or for the establishment of meadows and pastures is often as expensive as is the whole after-culture, and in some cases even more so. Knowing all this as plainly as actual figures could demonstrate it, Mr. Sullivan watched with eager interest the efforts of Mr. Fawkes and others to perfect the steam plough so as to adapt it to the culture of his broad acres, and on this account he has become so warm and so early a patron of the rotary spader invented and introduced by the Hon. C. Comstock, of Milwaukee, Wisconsin. The first of these implements was introduced upon the place last fall—to late for anything more than a partial test, sufficient being done, however, to strongly recommend it to Mr. Sullivan and his most capable superintendent, Mr. Eaton, and to determine them in an early and further test of its merits when spring should open.

For the benefit of those who may have seen no very detailed account of the construction of the spader we will say that the main frame of the machine consists of a wrought iron shaft with two cast iron heads keyed fast to it, one at each end, the shaft extending outward to receive the hounds attached to the tongue. To these heads are attached, by means of pins or handles, a series of large spading forks made of an iron head, each tooth being simply keyed to it. The tines or teeth are made of the best steel, eight or nine inches long, numbering from five to nine, according to the work to be done. On the end of each fork-head are roller cams, which pass between the periphery of the iron heads attached to the main shaft and an

outside guide attached to the same, and moveable so as to control the direction of the tines in entering the ground. The tines are slightly curved, like a fork tine, widened and sharpened wedge-like at the end, and the cams and track are so arranged that as the whole advances the tines enter the ground perpendicularly to the advance of the machine, causing no friction front or back, excepting that of the teeth entering the ground. When the fork has reached the centre of the machine at the bottom it begins to move backwards horizontally a few inches, thus moving the whole body of earth that has been loosened. It then rises rapidly by a quickened action of the cam, causing a vibrating motion of the fork, thus pulverizing the whole earth removed, and at the same time preventing, by loosening, any accumulation that may be taken up by the fork. When it is desired to move from field to field the outer cam guide is thrown forward by means of a lever at the driver's hand, when the tines of the forks, instead of entering the ground, become folded close to the heads, and the whole machine passes over the ground with as much facility as a roller. The operator sits upon the machine on a raised seat, protected from dirt by an iron shield passing between him and the forks. As now manufactured the whole weighs about 900 pounds.

That these machines are only fit to show upon quarter-acre patches at fair-grounds, and to furnish food for calculation as to what may be accomplished *supposing* them to prepare so much ground per day, or week, or season, it is useless for sceptics to urge, for those now in use on this farm have already fitted for planting at least two hundred acres. On arriving at the field we found two of the machines were being operated with four rather light horses each; one team driven by a man, who from choice walked, and the other by a boy riding and managing his team with ease. These machines were spading three feet in width and eight inches in depth, leaving the soil thoroughly pulverized the entire depth, and in complete order for the planter, which was in use on the land prepared the previous day.

Though the horses were such as we should consider unfit for any kind of heavy farm work, we do not think they showed heavier labour than they would have done if attached by single teams to ploughs working six inches in depth. We need not tell the farmers of the west that the ground was too wet to work easily, but what we here saw proves to us that the spader will operate as well or even better comparatively than the plough under similar circumstances. The horses are worked four abreast, as it is thought the draught is thus more equally distributed among them.

The other two machines, to meet the broad views of Mr. S., we found ganged together, thus cultivating six feet in width, and to the same depth as the first two. These were drawn by six yokes of oxen, below medium size, and driven by one man.

These are adapted for the use of oxen by simply lessening the number of forks and reducing the diameter of the cylinder, giving a more rapid motion, and at the same time reducing the weight. These ox machines do their work to the satisfaction of all, and are the especial favourites of the hands, the Irish driver characterizing them in his rather laconic way, as "*bul-ly* machines."

Of the amount of work capable of being performed by the spader our readers can, from the data given, make their own estimates; but it may not be out of place here to give a few figures as to the comparative cost of growing an acre of corn, made in the office of Mr. Sullivan. We will state that it is designed to attach self-dropping planters to the spaders, and thus accomplish the whole work with the same team. The price of labour of a man is reckoned at 1 dollar per day, a boy at 50 cents, horse 50 cents, and oxen 25 cents each. We thus have per day—

	dol. c.
One man, 2 horses, will plough 2 acres, cost per acre	1 0
" " 4 oxen, will harrow 20 acres, cost per acre	0 15
" " a boy, and 2 horses, will plant 10 acres, ...	0 25
" " 2 horses, will cultivate 8 acres twice ...	0 50
Total cost per acre ...	1 90

One man with spaders and eight horses, travelling the same distance (sixteen-and-a-half miles, spaders 3 feet 8 inches in length), will prepare and plant fourteen-and-a-half acres, which will cost, one man 1 dollar, eight horses 4 dollars—5 dollars, divided by fourteen-and-a-half acres, and we have

34½ cents per acre. Add cultivating, 50 cents per acre as before, and we have the cost of laying by a crop of corn 84½ cents per acre, or a saving of 1 dollar 5½ cents per acre over the common way.

Among the advantages of the spader over the common method of culture we may mention—

1st. The greater rapidity with which the soil is broken up, one spader being equal to three ordinary ploughs.

2nd. The dispensing with at least two hands necessary to accomplish the same work with the plough.

3rd. The dispensing with one team.

4th. Dispensing with the use of the harrow—requiring both team and men.

5th. Though not least—A culture of nearly double the depth of ordinary ploughing, the advantages of which in giving a crop with more certainty and of a largely increased amount, we do not deem it necessary to discuss, as it must be obvious to all.

It surely gives a saving of more than one-half the cost of growing a corn crop, and we certainly look for an increase of yield equal to twenty-five per cent. At least theory, and the experience of last year, on the farm of Mr. Barnes, of La Salle county, seem to indicate this.

We have no hesitation in giving it as our opinion that a new era in western agriculture dates from the invention of the rotary spader; and we yet expect to see steam the motive power in its use.

We should be pleased to give some of the many speculations upon the future of the spader, in the various uses to which it seems adapted, such as the spading in of small grains, fall and spring, the loosening up of "bound" meadows or pastures, and its enormous addition to the productiveness of our land, that were indulged in as several of us were gathered around the comfortable office fire at Broadlands. But all such will suggest themselves to others as they become acquainted with the machine, and many of them will soon be put to the test, when they will come before the public as actual facts, instead of somewhat vague theories. Be assured of one thing, however: Comstock's rotary spader is a practical implement, and will figure largely in western agriculture hereafter.—*The Prairie Farmer*.

[This implement may now be seen in work on Mr. Hamilton's farm at Acton, near London.—EDITOR.]

**HOW TO CHOOSE A COW.**—On this subject, the *Working Farmer* says: "There is always some risk in buying a cow, of whose previous character and history we know nothing, for there are no infallible signs of excellence. A rough, coarse, ill-shaped cow is often a noble milker. Yet there are a few points, generally agreed upon by experienced farmers, which it is well to consider, before purchasing. A small-boned head and light horns are better than large. Long legs make too wide a gap betwixt udder and milk pail, and long-legged cows are seldom quiet feeders, but wander about too much. A slender rather than a thick neck, a straight back, wide ribs and broad brisket, are to be sought for. The body of the cow should be large in proportion to head, neck, and legs, though not excessively large; and the hind-quarters if largely out of proportion indicate good milking qualities. Medium-sized cows, all things considered, prove the best milkers for the amount of food they consume. The colour of the hair has probably nothing to do with the milking qualities, and good looks should be regarded but little in purchasing dairy animals. As to the colour of the skin, a bright yellow, approaching that of gold coins, creamy colour within the ears—this and good rich milk are very apt to go together; and, withal, a soft flexible hide, loose over the ribs and rump, is also to be sought. The udder should be large, soft, and full of veins, which ramify over it, with full-sized milk veins stretching forward along the belly, and the teats be large and not crowded together. Test the cow's disposition and inquire about it. Irritable and nervous cows are unpleasant to handle, and almost always scanty milkers. Something can be ascertained from the looks and motions. Large, mild eyes, easy quiet motions when driven, and gentleness when handled, indicate good nature. What butchers term 'good handling' is an important quality in a milch cow, for it indicates not only good milking properties, but easy fattening, when services in the dairy are over."

## ON CROSSING SHEEP.

Amongst the many changes and improvements which have been effected in Scottish farming during the last twenty-five or thirty years, there are few of greater general importance, in certain points of view, than the practice of crossing pure but inferior breeds of cattle and sheep with others of a superior description. One result has been that the good qualities of what we call the inferior breeds have been retained, whilst others are at the same time superadded; all being so blended together as to form a combination of properties not to be found in either of the pure breeds from which the crosses have sprung. With this there has been a most material increase in the supply of human food, arising chiefly from the greater tendency to early maturity in the crosses than in many of those breeds from which their dams have been taken. It is but lately, comparatively speaking, that the idea of slaughtering shearing sheep, in a perfectly finished state for the use of the consumers, would have been scouted as impracticable, were it broached in a company of breeders and graziers; yet sheep of that age, and even younger, form the principal part of the supplies in most fat markets, affording the public more than double the quantity of meat which could be produced when we had to wait until the animals were three, four, and even five years old before they reached the butcher's stall. Epicures, indeed, may lament the increasing difficulty of procuring a joint of their favourite five-year-old hill-fed black-faced wether mutton; but the general public are better served, and that is the chief thing to be considered.

From the improvement in pastures caused by surface and other varieties of draining, and also owing to the freer use of turnips in the case of hill hogs than was the rule a quarter of a century ago, the breeding of crosses is now carried on in districts where at one time a very different system prevailed. We know hill farms where a wether was never sold until at least three years of age, and yet these farms are now sending out crosses at half that age, which bring higher prices than the aged sheep did at any time in our recollection. Those breeders, therefore, who follow this system have quicker returns than their fathers or predecessors could realize; the markets are more fully supplied, so as to meet the increased requirements of an increasing number of customers; and landed-proprietors obtain higher rents, although, we dare say, some will consider the latter a very doubtful advantage.

If the system of crossing has been satisfactory in the case of sheep, it has certainly been not less advantageous in that of cattle. The splendid Scotch crosses which form the principal article of demand for London "West-end" consumption appear to exhaust the powers of reporters, especially when describing the supplies sent forward to the Christmas markets, in consequence of their extreme excellence in points of symmetry, quality, and finish. We all admire the noble West Highland bullock, and the somewhat less imposing, though not less useful, Galloway; but if we adhered to these, and possessed no other breeds, we would be very far short of meeting all the demands which the consumers of high-class meat at the present day make upon graziers. We must, no doubt, keep these and some other breeds pure, for the purpose of procuring pure-bred females for crossing purposes; and, for this very reason, too much attention cannot be paid by those who possess the pure breeds, and whose pastures suit them, to their improvement in every respect; for by attending diligently to this point, they not only benefit themselves, but their customers and the public generally.

The Leicester ram is that which has been chiefly used in Scotland for crossing ewes of the black-faced and Cheviot breeds, and the result of such crossing is the production of a most useful class of sheep, both in respect to wool and mutton. Whilst we acknowledge, therefore, the value of the Leicester cross, we are desirous of bringing under the notice of our readers the merits of another breed which more than rivals the Leicester for the purpose to which our remarks refer. We allude to the Shropshire, a breed which has risen to vast importance in England, owing to the great care which has been bestowed upon its improvement, so that it now ranks amongst

the very first in the list of English breeds of sheep, is spreading rapidly into different parts of England hitherto occupied by other varieties, and is coming into great favour in Ireland. It is, however, little known as yet in Scotland, but we believe that it only requires to get a fair trial by Scotch graziers to render it quite as much a favourite with them as it is in other parts of the kingdom.

There is a great deal, in fact, in the Shropshire breed to recommend it to Scotch graziers. Sprung originally from a small but very hardy mountain race, which have existed from time immemorial in the moorland districts of Salop and Staffordshire, it possesses great vigour of constitution; it attains maturity at an early age; the mutton is well mixed, greatly resembling that of the Scotch black-faced, a similarity which is still further carried out in the rich juiciness of the flesh; the ewes are first-rate nurses; and the wool is close set, heavy, and valuable to the manufacturer. It is alleged that the Southdown has been employed in crossing the Shropshire native breed. This was done to a certain extent, perhaps, half a century ago, and we have no doubt with a degree of success at the time; but it is a certain fact that wherever modern breeders of Shropshires have been foolish enough to introduce the Southdown, the result has been such a complete failure, a every respect, that they have had to renew their flocks altogether. They have been driven out of the market for years, in consequence of their sheep, owing to this Southdown cross, having lost weight, caste, and character; and no one of experience would think for a moment of resorting to such a cross with the view of improving a well-bred Shropshire flock.

The Shropshire breed is truthfully described by Tanner, in his Prize Report of the Agriculture of Shropshire, as combining "the symmetry and quality of the Southdown with the weight of the Cotswold; it possesses the fatness tendency of the Leicester without its delicate constitution; but this disposition to fat is combined with such a development of the muscles of the body, that beautifully marbled meat is produced, which can go on any table in the kingdom, and especially among the higher classes of society, where the excessive fatness of the Leicester mutton is objectionable. The price of this mutton is as high as any in the market; and when this is said of sheep ranging from 35 lb. to 40 lb. per quarter, and carrying fleeces of the best quality from 6 lb. to 12 lb. in weight, it must be admitted that such a breed is indeed of very high value."

True-bred Shropshires are easily distinguished from the Southdown breed by their greater size; their wool is a little longer, but still as close as that of the Southdown. Their faces are usually of a dark-grey colour, inclining to black, that of the legs being still more decidedly dark. They have good backs, with long quarters, and full leg of mutton, being particularly good where most Leicesters are defective. They have a good expression of countenance, the face and ears being on a larger scale than in the Southdown, without exhibiting any approach to coarseness.

But with respect to the value of Shropshires for crossing inferior breeds, for the production of fat lambs, or of sheep to be fattened off at an early age on turnips, we have it in our power to say, after several years' close observation, that we do not know of any breed—the Leicesters excepted—which excels it. There is one point in which strangers will often be deceived, when judging the lambs by the eye, whether the lambs are pure-bred or crosses, namely, in the weight, for they often weigh much heavier than their appearance would warrant at first sight—a fact, however, which is very soon found out, once a person goes among them and tries them. The same feature accompanies a matured age, and we have often seen a look of amazement on the faces of those who have tried to turn a fat Shropshire wether for the first time, or a cross of this breed.

Amongst the many illustrations of successful crossing with the Shropshire to which we might refer, there is one of considerable interest to Scotch breeders, seeing that it is a trial, extending over several years, of crossing black-faced ewes with

Shropshire rams. This cross has been carried on, with the most satisfactory results, by J. W. L. Naper, Esq., of Loughcrew, in the county of Meath, Ireland, and to that gentleman, and his clever farm-manager, Mr. Alexander Stewart (a Perthshire man, by the way) is due, in fact, the credit of having first originated the cross, and then tested it by such extensive and repeated trials that its merits are now settled beyond a doubt.

Mr. Naper had been in the habit of crossing with Leicester rams; but as that cross did not come up to his expectations in some points, he tried a cross of the Southdown on his black-faced ewes. The result was that the mutton of the Southdown cross was improved in point of quality compared with that produced by the cross of the Leicester, but there was a loss of weight; and about eight years ago, the Shropshire was resorted to, in order to try whether the weight could not be increased, and the quality at the same time retained. In both points the cross has been most successful, giving early maturity, weight, and quality, with a vastly improved fleece.

We find that the black-faced ewes have cost Mr. Naper from 10s. 8d. to 16s., the latter being the price paid last year, and with moderate keep—turnips and a little hay from January until March or April—his cross hogs weigh 20lb. to 22 lb. per quarter, and at twenty-four months up to 29 lb. and 30 lb., the average at the latter age being 25 lb. per quarter. The crosses are uncommonly healthy, and Mr. Stewart believes that they are as hardy as their black-faced dams; but, as he very sensibly remarks when questioned on this point, that, although such is his belief, yet that in the comparatively mild climate of Loughcrew there has been no opportunity of testing this point. At the same time we may state that part of the lands of Loughcrew, forming a portion of the summer pastures of these crosses, are from 600 to 900 feet above the level of the sea.

The cross fleeces weigh from 6 lb. to 8 lb., whilst that of their dams range from 3 lb. to 4 lb. each. The price obtained in Dublin, in 1860, for the cross wool was 26s. 6d. per Irish stone of 16 lb.; and in November last, when prices were lower, 24s. 6d., when the highest prices going for any description of hogg wool did not exceed 25s. or 25s. 6d. per 16 lb.: black-faced wool brought 14s. 6d. to 15s. 6d. per 16 lb.; so that the comparative value of the fleece of the Shropshire cross, not only as regards the wool of the pure black-faced, but also of other crosses, may be easily calculated.

There is not a doubt but that the introduction of Shropshire rams for crossing in Scotland would be attended with the very best results, for we find it quite as satisfactory in the case of Cheviots as in that of black-faced ewes. The very fact that the mutton produced by this cross is of splendid quality ought alone to be sufficient to recommend it to Scotch breeders, so that their cross-bred fat sheep might in all respects equal their cross-bred fat cattle. In the hope, therefore, that the cross we have been alluding to will be tried next season, we shall further state that the best time and place to obtain Shropshire rams is at the several annual auctions which are held by breeders in Shropshire and Staffordshire during the months of July and August, and also at the Shrewsbury August fair; and we may further say—because we speak from experience—that strangers wishing to procure good rams will be quite safe if they put themselves into the hands of Mr. W. G. Preece, the auctioneer in Shrewsbury, who is a perfect judge of Shropshires, and, in fact, the Stafford or Wetherall of the breed.

There is yet one point to which we intended to allude if our space permitted, but at present we shall merely broach it, without entering into particulars. It is this—considering the mountain origin of the Shropshire breed of sheep; considering the close affinity they bear to the Scotch black-faced in point of quality of mutton; considering, further, the hardness which is a prominent feature in them, might not a touch of Shropshire blood be judiciously introduced into the black-faced breed, with a view to its permanent improvement, especially in reference to the fleece? This, however, is chiefly a matter for after-consideration, and we merely throw out the hint in the meantime, being at present more anxious, on the whole, to see Shropshire rams used for regular crossing, in the same manner as Leicesters have been employed for so many years.—*Scottish Farmer.*

[There is so far such a want of uniformity of character in the Shropshire sheep that must tend much against its value for crossing.—EDITOR.]

## H E A R T'S - E A S E !

BY MARK!

[From the *Sporting Review*.]

I left the gay city, for my love had left me,  
And went to the country, down into the South;  
And wandering about—I was thinking of thee!  
My loved one! with my heart up into my mouth.

I walk'd in the fields among the wheat stubble  
Feeling so lonely! in a desolate place,  
Low bending to earth in the midst of my trouble,  
A sweet little flowret look'd into my face—

And singing and crying in bitter distress,  
Oh! there is the treasure I wish to possess.  
"Heart's-ease," ease my heart—oh! it never can be,  
The love of my life has departed from me.

A stir, and a whirl, and a rush of surprise,  
Flush'd up from the ground, just under my eyes;  
A covey had risen—brown beauties were they,  
I shot right and left as they flutter'd away.

Bang—chang—rang in time, the musical sound,  
The old cock and hen lay flat on the ground;  
And a brace of young birds as plump as the old,  
Not far from the old 'uns, over were bow'd!

In loading my gun, 'neath its butt, I espied  
A sweet little heart's-ease, about which I sigh'd—  
I press'd it hard down into the grass,  
And cried, Ease my heart, alas! ah! alas!

The love that has fled is better away,  
So let me enjoy this beautiful day.  
The dogs were at "down charge," the birds were at rest,  
I pick'd up two brace, and the young were the best.

"Hold up!" I cried out, and the two went away,  
Off-bounding like elegant creatures at play,  
Then dividing, made separate casts of their own  
Over the ridges which had closely been mown.

With stern like a racehorse, Czarina the fair  
Went off 'gainst the wind, her head "high in air,"  
Made the first point, in just running over  
A fallow, to a piece of young clover.

And far in the distance, watchful Therese  
Buck'd like a beauty, and stood at her ease,  
With neck stretching forward and full earnest eyes,  
And tail like a fine-pointed arrow that flies.

There they stand, their separate duties performing;  
I admire! and feel the beautiful morning.  
As forward I walk to the beautiful clover,  
Bang! bang! right and left a young bird is over.

And down falls each dog as she hears the report  
Awaiting commands, and enjoying the sport,  
When, lo! looking down, a heart's-ease is seen,  
Beautiful floweret, with long leaves of green.

In thy lone existence I plainly can see  
That, although I am lonely, yet I am free;  
Then heart be at ease, for depend it is best  
To hide the fond passion of love in the breast.

Go walk in the fields on the 1st of September,  
The crosses of life you will scarcely remember;  
Your dogs, and your gun, and the beautiful flowers,  
Are better than love, with its feverish hours.

**ARTIFICIAL COMB FOR BEES.**—A Swiss invention has been introduced into this country, to aid bees in the formation of their comb. Narrow sheets of wax are imprinted by machinery so as exactly to represent the dividing wall of comb between the cells. These stripes are attached to the top of the empty hive, before the new swarm is put in, thus enabling the bees to go immediately to work, and also in guiding them in making the sheets of comb in the proper direction.

## MIDLAND FARMERS' CLUB.

## THE GAME QUESTION.

A general meeting of the members of the Midland Farmers' Club was held on Thursday, Oct. 4, at the "Acorn" Hotel, Temple-street, the subject for discussion being "the game question," Mr. A. Robotham, of Drayton Bassett, reading a paper on the subject. There was a large attendance, Mr. G. A. May, in the absence of the President, occupying the chair.

After dinner the Secretary read a letter from Mr. Chawner, who said: "I still retain the same opinion on the subject of game, which I have previously expressed to the club, viz., that the question of game must be met by the question of rent. If a tenant took a farm free from game, or one where he had the sole control of the game, he would pay a farm rent; but where there was game, that was a farm partially stocked by his landlord, and the tenant, when he had calculated the consumption of his stock, and other damage sustained by him in the preservation and destruction of game, would offer a game rent. Whenever this distinction of rent was established, the game question would be settled. Valuations for damage satisfied neither party (Hear, hear), but left ranking bad feelings where only mutual confidence should exist."

The CHAIRMAN then said they were met there to discuss a very important subject—important not only to farmers but to landowners and the public generally, and he hoped it would be discussed in a fair, liberal, and enlightened spirit. He begged to call upon Mr. Robotham for his paper.

MR. ROBOTHAM then read the following paper: Gentlemen, I would not have consented to come forward and read the paper I am about to read on this very important subject, the Game Laws, were I not quite sure that there are gentlemen present who are willing to take part in the discussion which I hope will follow what I am about to state, that will bring to bear upon it such an amount of intelligence and knowledge of the subject as will make up for my shortcomings and want of ability. Without further preface, I will therefore proceed to state my views, and although I can neither speak learnedly nor fluently on the subject, I can with truth say I speak feelingly, having suffered severely the last three years from game. I propose first to point out some of the evils resulting from the over-stocking with game, hares and rabbits in particular, giving an instance that has come within my own knowledge; also one or two extracts from the opinions of noblemen and gentlemen who have seen the evils of preserving game, and, to their honour be it spoken, were good and bold enough to give it up, and turn that time and capital which was wasted on game to the improvement of their estates, and, as a matter of course, thereby adding very materially to the quantity of food produced for their fellow-creatures—the only legitimate use to which land in this country, as a rule, should be put. The instance which I shall quote, and I can myself vouch for its accuracy, took place in the year 1859—that of Mr. Owen Bennion, of Ruckley Grange Farm, Salop. The produce of that farm for twelve and in some instances eighteen months made these wonderful prices:

	A.	R.	P.	£	s.	d.
Lot 1, a rick of wheat the produce of 5	2	16	...	5	5	0
Lot 2, a rick of rye the produce of ... 3	3	0	0	...	5	0
Lot 3, a rick of barley the produce of 8	0	0	0	...	5	0
Lot 4, a rick of barley the produce of 9	2	14	...	11	0	0
Lot 5, a rick of barley the produce of 16	1	14	...	0	10	0
Lot 6, a rick of barley the produce of 11	2	14	...	17	0	0
Lot 7, a rick of wheat the produce of 17	2	10	...	3	0	0
Total .....	72	1	28	...	46	15

Here we have the produce of 72 acres of good land sold for the enormous sum of not quite £47, about one-thirteenth part of what it should have been, but for the vermin called game. But I have not quite done with Mr. Bennion's sale, for the grass keep was sold as well as the corn. There was a large quantity of meadow land, which had been boned at the ten-

ant's expense in 1857, and had no stock upon it except rabbits from the 22nd of September, 1858; and the produce of this up till the 2nd of February, 1860, a period of eighteen months, was sold for 7s. 9d. Mr. Bennion stated with regard to the farm, that he had sown upon it 12 tons of artificial manure, a fact which the spectators did not seem to doubt, as they considered the farm in an excellent state of cultivation. The eating of the young seeds on 45 acres up till the 1st of November was sold for 8d. per acre; this took place on the 29th September, 1859, before the rabbits were made game. By our wise legislators had not made the rats game as well as rabbits, then they could have ensured in some cases the total destruction of the crops. There is a blessing promised to those who feed the poor, and a curse pronounced against them *who withhold bread!* and in this case both blessing and curse are literally fulfilled; for, the tenant is still upon another farm: a happy and prosperous man, highly respected by all who know him; and the landlord is become an insolvent debtor, detested by all good men. I could point to many cases where the tenant has been fairly eaten out of house and home by the game; but for the purpose of bringing the matter forward for discussion, I hope this will suffice. I may mention incidentally that Mr. O. Bennion left the farm and brought an action against his landlord, and obtained heavy damages from him, but all are not in the same position as Mr. Bennion was! If you say the farmer who suffers so much from game is at liberty to leave and take another, I answer with many it is impossible, and in two ways it is so: First, they are so impoverished by the game eating their crops that they have not capital sufficient left to take a farm where game is not preserved; but for a landlord who is not a game-preserver is, as a matter of course, an improver of his estate, and wants tenants of both skill and capital. He would, therefore, hesitate to take in a tenant who was leaving a farm, without making some inquiries about both the capital and the skill of his applicant. The person most likely for him to ask in the first instance would be the landlord or his agent (whose estate he was leaving), and who no doubt is irritated at the man leaving; and he gets such a reply as this: "The farm he is leaving is in a foul state, and I cannot recommend him as a tenant to you, who are so particular;" or, "The man has plenty of means, but he lacks energy, for he has not farmed with sufficient spirit;" or, "He has been very troublesome about game, and caused me some annoyance, so I gave him notice to quit," &c. Either such answer, though perhaps not strictly untrue, would make a gentleman who wanted a good and improving tenant on his estate hesitate about taking on a tenant with such a recommendation. Now, I ask, who can keep a farm as clean as it ought to be, where game is preserved to the extent it is in some quarters? for we all know where the game destroys the grain crop, the weeds fill up the space; or, who can display that amount of energy and skill to raise a crop he is almost certain will be destroyed by vermin nick-named game, as he would do had he only the seasons to contend against? The game nuisance has a most depressing effect both morally and physically on a man. For I defy any farmer, I do not care who he is, to walk through his fields at any time in the year, and find his crops daily diminishing, eaten away by the hares or rabbits, to come to his house either in a good humour or with a good appetite, therefore he suffers morally and physically. Suppose this walk to have been taken in the morning before he goes to market, is he in a likely mood to buy a new and improved implement, a few tons of linseed cake or artificial manure?—all necessary where land is to be farmed high. I say no, he is not! Therefore do not be surprised if a man who is placed in such a predicament should go on the old jog-trot way as long as he can, and spend his all in trying, year after year, to meet his engagements; and when he can do so no longer, then comes the game-preserver, as landlord, and sweeps off the little he has left, for rent, in many cases not leaving a farthing for his other creditors—the tradesmen who



have been helping to carry him on, and who a few years ago counted this man amongst their highly-esteemed customers and friends, and who they see, with sorrow, reduced to the position of a day-labourer, perhaps on the very farm he has been reared upon, and tried hard to keep. You may say this picture is over-drawn; but I say it is not, for what I state is of frequent occurrence. The late Lord Hatherton stated, in his evidence before a select committee of the House of Commons, in the year 1846: "He had enclosed nearly 4,000 acres of waste-land on his property, and consequently become a great farmer. From that time he had generally had 2,000 acres in his own hands under improvement, and he found, to pursue the two occupations—a rigid preserver of hares and game generally, and an improver of land by planting and farming, was perfectly incompatible." Another gentleman, Mr. Pusey, said: "Game-preserving is daily becoming an exclusive luxury for the owners of large property, and less a source of healthful exercise for country gentlemen of moderate means." He adds, that at one time he was a rigid preserver of game, and that he gave it up in consequence of seeing his tenants' crops damaged by the hares and rabbits, and he found "that one of his tenants had given up growing winter vetches altogether, in consequence of the abundance of hares." This was not a sudden determination, but in consequence of what he had observed for some years. He mentions some particular cases of injury which he had seen on his own estates, and says "that it would be almost impossible to grow winter vetches where there is an abundance of hares. I have a strong case now of injury to wheat, which occurred only two years ago. A tenant of mine came to tell me that he must give up his farm; he was a very improving tenant indeed. I asked him why? He said the injury which he received from the game was such that he could stand it no longer. There was a piece of 60 or 70 acres of wheat, and he told me that it had been completely fed away by game from a neighbouring cover; and he asked me go over it. I did so, and I can state positively to the committee that half of that field I should not have known had any crop at all upon it; this was light land. I said to the tenant that his loss should be valued, and I paid him the loss." A circumstance which made a strong impression on Mr. Pusey's mind was that his game-keeper, who had three or four acres of land near his house in the covers, after cultivating it for eight or ten years, said at last that he must give it up, "because it did not pay him; it would ruin him;" and this induced Mr. Pusey to consider what was the case of the keeper's neighbours round the covers. The injury to this man's land, "which he held rent-free," was so much that he gave up the land. When he first took it, he said "he did not mind the rabbits and hares having a share of it," but after ten years he gave it up. Since game-preserving had been given up, "land round the covers, which had produced nothing before, had become extremely productive." "I should wish to observe that it has been often asked how many hares were equivalent to one sheep on a farm, but that appears to me to be a perfectly unjust view of the question. If you had a score of hares folded like a score of sheep on any part of the farm, they would eat all they could find, and it would be but a small loss; but the question is, what the loss would be if the sheep were allowed to wander over the whole farm, and help themselves where they pleased? If you put the case of a single animal coming into a kitchen garden—if anyone had the right to turn a sheep loose into a kitchen garden of five or six acres—and help himself where he pleased, it is evident that you could not measure the injury to the garden from the mere amount of food that a sheep would consume under ordinary circumstances; then the annoyance to the farmer must be very great. I say that even if you ascertain that three or four hares do not eat more than one sheep, you could not estimate the amount of injury to the farmer by the food eaten by an equivalent number of sheep, because the hares are allowed to help themselves, and to go everywhere where they ought not to go; and independently of that, the positive loss, the annoyance to the farmer who has cultivated his land upon improved principles, is very great. It may be a question, upon certain kinds of soil, whether it is an injury or not to wheat to be fed down; but still, as a farmer myself, I should like to have to decide upon it myself whether I would have my wheat fed down." I would strongly advise all who have not read the draught report prepared by J. Bright, Esq., M.P., for the adoption of the committee of the House of Commons on the Game Laws, in 1846, to do so. They would find

most valuable information therein. One gentleman stated, in his evidence as to an enormous quantity of hares, that there had been forty-six counted on one field of only 12 acres. This was in June, 1846. In February, 1865, I know where there were seventy-five hares counted on one field of wheat of only 6 acres, so that the evil is greatly on the increase; but with that comes the assurance that when things get to the worst they are sure to mend; and I think that I can foresee that if this subject is well discussed, and it can be proved to the satisfaction of the great majority of the inhabitants of this country that they are paying 2d. per lb. more for all the meat they consume than they ought to do, because game is preserved so excessively, and which I hope to prove to you, by a simple calculation I have made, they are doing, that we shall enlist such an amount of sympathy and support from all classes as will enable us to get such a modification—if not total repeal—as will enable the farmer to get a fair remuneration for his skill and capital, and at the same time benefit the whole community—those who uphold these iniquitous laws into the bargain. The only difference will be that game will be kept in moderation, and they (the landlords) will become what their fathers were—sportsmen in the true acceptance of the word, viz., hunt their game, and kill it; instead of, as at present, making themselves aristocratic butchers, by having it driven to them to be slaughtered. I have heard it alleged, as against the tenant-farmer, that he does not look up to and show that respect to his landlord which has hitherto existed between them; but the landlords should remember that there is a wide difference between the fine old aristocratic lord of yore, and the half-butcher, half-poulterer, game-dealing lord of the present day. Rearing and keeping game in a tame state to be slaughtered at leisure is a very different thing to what the old sportsman thought about when he said: "You have small satisfaction in shooting a fat buck in your own park; kill a stag in the Highlands, and you are in ecstasies! I do not think there could be found many farmers in England who would not feel a pride in having a sufficient quantity of game on his farm for the recreation of his landlord, and who would not make it a point of honour diligently to look after it, and save all the expense of gamekeepers, night-watchers, and the disguised gamekeepers called policemen. Hear what the Rev. Chas. Kingley, in his "Water Babies," said about those pests of society, gamekeepers and poachers. "The gamekeeper," said he, "is a poacher turned outside in, and the poacher is a gamekeeper turned inside out." Another source of annoyance to the tenant-farmer is, that he not only keeps an excessive quantity of game for his landlord, but he has to keep almost as much, if not quite, for the keeper and his satellites, to pay their scores off at the public-house. Ned the Cellerman and Dame Margery were not far out, when they sang—

"Oh! oh! oh! the keeper does know  
Where many a thousand couple doth go."

Is it not monstrous that a man must not only suffer his crops to be eaten by vermin, but must pay, in the shape of county rates, for policemen to watch that no one hurts that vermin while they so eat it? It may seem to those who have not given this subject a consideration a small matter, and one only in which landlord and tenant are concerned; but I say it is a gigantic evil, and if you will allow me, I will read a calculation I have made, by which I think I shall convince you that the whole community is interested. I will try to show what number of sheep could be kept in place of the excessive quantity of hares and rabbits—mind, only the excessive quantity! For I would not interfere with the winged-game or hares and rabbits in moderation. In round numbers the acreage of England is 32½ millions; take from that 8½ millions for roads, towns, lakes, rivers, and land upon which game is not or cannot be preserved; then take 8 millions more as land upon which game is moderately preserved, it leaves 16 million acres upon which, at a very moderate calculation, one hare or one rabbit is kept per acre. Now, I should say one hare to every four acres is a fair quantity for sporting purposes; therefore that would leave us an excess of 12 millions of hares or rabbits—say 6 millions of each, which for the purposes of food would be worth—

Six million hares at 3s. each	...	£900,000
Six million rabbits at 1s. each	...	300,000

£1,200,000

Taking it for granted that 2 hares and 2 rabbits eat as much as one sheep, it follows that if only the excessive quantity of game was destroyed, 8 millions more sheep might be kept, which at 12 months old would be worth 40s. each, making £6,000,000-worth of food in place of £1,800,000, or equal to an indirect tax of £4,800,000 upon the food of the people, or as large a sum as would pay for all the cattle and sheep imported into this country for more than a year. But this is not all: I only calculate what it would take to keep each of them. But it is a well-known fact that game destroy more than they eat; and again, you do not ensure having them killed off at a given age, like sheep; therefore the sum set down as the value of the hares and rabbits is much over the mark, while at present prices the sum for the sheep is much under it. So if you take it for granted, which I think no one can deny, that 2 hares and 2 rabbits consume as much as one sheep and destroy as much more, you raise the tax on the food of the people to at least £10,000,000—a greater sum, I believe, than was ever paid in one year during the palmy days of protection as a tax on food. But in estimating the loss to the public, we ought not to stop here, for is not the preservation of game the means of preventing an improved mode of cultivation? and therefore keeps that back which ought to be progressive. We have just now introduced another foreign evil amongst our cattle—the rinderpest. Is not the game-laws the native hinderpest? *A propos* of this: I see a correspondent of the Aberdeen journal starts the theory that the hares and rabbits are as likely to spread the cattle plague as sheep and lambs. He says they are moving about on the pasture in hundreds, and many carry infection all over the country. Shall we get an order in council requiring the owners to keep them at home, or giving anyone permission to kill them if found straying? And what is all this wanton waste for, but that a few may display their wonderful powers of slaughter, and then advertise in some sporting paper that they had in so many hours killed so many head of game: thus publishing as something great and to be made public what they ought to be very much ashamed of, and keep as private as possible. Here is a sample of the advertisements I allude to, taken from the *Leicester Journal*: "The Earl of Stamford and Warrington entertained a distinguished party at Bradgate, who in four days killed the following quantities of game:

1864.	Hares.	Rabbits.	Pheasants.	Various.
December 20 ...	363	595	770	19
" 21 ...	226	216	2012	20
" 22 ...	195	340	1524	9
" 23 ...	195	2718	390	18

—total, 9,610." The Bradgate estate is only 8,814a. lr. 4p. On his estate at Ewville in one day they killed 600 hares, exclusive of other game, in one cover. What an ignoble aim for a man to live for, and spend his own fortune, and rob scores of tenants, to obtain merely that he may be able to exclaim, "I am a great preserver of game; and I and my friends have killed a greater quantity of game in a given time than any other men in England!" Would to God they would also add this great truth—"and have caused more misery in the breaking up of families, sending their fathers to prison, and the mothers and children to the union, and done more destruction to my tenant's crops, and consequently helped more than any other living being to raise the price of meat to its present height, and to bring down upon the class to which we belong the just indignation of an outraged people." I wonder if it ever occurs to these great game-preservers and oppressors of their tenantry, that they are themselves only tenants-at-will, and in one respect are worse off than those they so oppress, inasmuch as they cannot demand a six months' notice to quit, but may be called upon by the great Landlord of the universe to give up at a moment's notice those broad acres they are so proud of, and which have only been lent to them as so many talents, of which they will surely be required to give an account! If the game preservers can read the signs of the times, they may learn a useful lesson from what befel the godfather of that most wicked *brat* called the Poaching Prevention Act, conceived and brought forth by our born legislators, and adopted by the misrepresentatives of the people in that uproarious and undignified manner that gave calm and thinking men the idea that many members must have been in that state which we are told is no excuse for the commission of a crime, but rather

an aggravation! When he presented himself before the electors of South Shropshire, did they return him again a member? No. They gave him what he well deserved, rabbit-skins instead of votes, returning him to that obscurity from which it would have been well if he and the like of him had never come forth. Another sponsor of that wicked *brat*, who is not particularly fond of music, heard that at Derby which would not sound very harmoniously in his ear. The whole course of legislation has of late years gone *dead* against the British farmer, and all in favour of the foreign agriculturist. The repeal of the corn-laws, the introduction of foreign cattle, the reduction of the duty on foreign wine and spirits, the remission of the export duty on beer: all these tell hard against the British farmer, but against all these he has striven manfully, and would continue to do so, if let alone; but his friends the lords of the soil say, "We must still further: clip his wings, or he will be able to rise yet. We must set up his crops while growing, and forbid him to poison his enemies, the sparrows and other birds that take his crop when ripe; make the vermin rabbits game, and if he see that he may use the produce we leave him as he pleases, we say No! On one part of it at least we must have a tax of 50 or 40 per cent.: because we have remitted so many taxes for the benefit of the foreigner we must still contrive to grieve the native." The old story, "Send missionaries to the blacks beyond sea, but neglect the blacks at home." I would suggest for the consideration of the Malt-Tax Repeal Association if they have not made a slight mistake, and put the cart before the horse, in trying to give the working-classes cheap beer instead of first giving them cheap meat. Meat and drink; not drink and meat. They have already cheap bread, give them cheap meat; at all events, don't tax it for the benefit of a few. I am very much mistaken in the British workman if in a very short time he does not demand from them who have made wine cheap—which the working-man cannot get—the repeal of the Malt-tax, so that that native beverage, which he has and must have, shall be cheapened also. Farmers of England, the repeal of the Game-laws and the repeal of the Malt-tax are justly due to you, and do not be satisfied until the debt is paid. It has been well said that those who by their skill make two blades of grass grow where only one grew before are benefactors to their country. What then shall be said of those who make a sheep grow worth £2 where only two have grew before worth 5s. or 6s.? This I hope to be the mission, under an all-wise Providence of this club, by bringing this crying and ever-increasing evil before the notice of the public. As the potato disease was through the all-wise dispensation of Providence made (by raising the price of corn to an almost unbearable height) an instrument in the hands of the great Sir R. Peel, which enabled him to carry that great and good measure the repeal of the corn-laws, so may we hope that the cattle plague from which we are suffering may, by raising the price of meat to the enormous height it is at present, be made by the same all-wise and merciful Providence the means of strengthening the hands of some other great champion of the people, who shall bring forward a bill for the total and immediate repeal of the most iniquitous piece of class legislation ever enacted in any country. The energetic way in which the people of Birmingham demanded the Reform Bill was to a great extent the means whereby that measure was obtained. Manchester gave us the repeal of the Corn-Law; and now may the blessing of Providence so rest on my humble endeavours to point out the evils of these wicked laws, that this meeting may be the means of so opening the eyes of the inhabitants of this great town, that they shall make themselves so well acquainted with their own and their fellow-countrymen's true interest as to demand in a firm but quiet manner their repeal, and thus render to posterity a blessing in no way less than that conferred by the passing of either of the other two great measures.

At the conclusion of the Paper Mr. Robotham said he had had a correspondence with a good many persons, and among the rest the respected member for that borough, Mr. John Bright, and, with the Chairman's permission, he would read it:—

Bookdale, September 30th, 1864.

DEAR SIR,—I am glad to hear that you are about to read a paper on the subject of the Game Laws. I do not think much good would be done by holding a meeting in Birmingham.

The towns are known to be against the game laws; but so far as the county constituencies send game preservers to Parliament, the members for the towns can do nothing for the farmers. It is about twenty years since I gave much time and labour with a view to relieve the farmers from the evil of the game laws, and I spent at least £300 in bringing before them and the public some of the facts of this great grievance. Up to this time nothing has been done in the way of relief, but, on the contrary, the laws which favour the preservation of game have been made more strict. I fear the evil has become not less, but greater, and I see only one way in which any real improvement can be made. It can only be done by having in Parliament a larger number of representatives of the people, and fewer representatives of a class, and of the prejudices and usurpations of a class. How can this be brought about and secured? By the admission of another million of the people to the elective franchise, so that the House of Commons may become truly representative of the true interests and wishes of the nation. But there is one thing which the farmers may do for themselves, whenever an election for a county takes place. At present they are not asked who shall pretend to represent them, but the lords and squires of the county name the candidate, and, as a rule, the tenant farmers vote for him, and he enters the House to do the work of the lords and squires who selected him; a main part of that work is to keep guard over the laws which favour the preservation of game. I know how many reasons there are why a tenant should be disposed to support the nominee of his landlord. He feels in how many ways his landlord or his landlord's agent can annoy and ignore him, and he submits to a power which he has not learned to resist. But the time is coming when tenants will dare to believe and act for themselves in the performance of their political duties. They can combine with great ease, and when combined their power is irresistible. I hope the day may soon come when they will take the election of members in the counties in some degree into their own hands, and when this is done their political and social deliverance will be secured. You will see at once how easy it is for you to combine. Every farmer has a horse and a gig, or dog-cart, or conveyance of some kind, so that he can go to the poll without any cost to himself. Farmers meet almost every week at their market town, and they can know the feelings of their class without difficulty. In every county they should select a "farmers' candidate." If a good tenant farmer can be selected, bring him forward; if not, then some other respectable and intelligent man. If you can find a landowner who is willing to be just to the tenant farmers, both in his own private conduct and respect of legislation which affects them, take him as your candidate, and give him a zealous support. You can contest a county at almost no expense. A subscription of one pound from each tenant will raise a sum large enough to pay for all the printing you will require, and you can take yourselves and your neighbours to the poll at a trifling expense. The farmers' candidate will be the popular candidate. The Liberals in the towns will give them their support, and you will carry him into Parliament to do the work of the farmers and of the people, instead of that of the lords and squires. Some will say I am advising you to work a revolution; and so I am. It will be a revolution that will transfer the county representation from a dozen rich men, or families, to the real people of the counties. It will send members to Parliament who will care more for the rights and interests of the population than for the semi-barbarous sports of a class. When the tenant farmers see their power, and arouse themselves to exert it, the days of the game laws are ended, and there will not be wanting just and brave men among the landowners themselves who will give them a hearty co-operation in the good work. As to changes in the game laws, I see no great good in them. What you want is the repeal of all laws which are made with the object of favouring the preservation of game. The fundamental principle of the tenant farmers should be this—that they should have absolute and undisputed ownership of, and control over, all animals which live upon the produce of their land. They occupy land and pay rent for it; they risk all they have—their money, their time, their labour, their hopes, their present, and their future, in the cultivation of their farms. The horses, cows, sheep, and swine are theirs; the crops are also theirs, and the hares, and rabbits, and game of every kind living upon their farm should also be theirs. Till this is the settled law, and also the practice of the country, the tenant farmers will never hold the position to which they have a just claim, and the evils of game laws and game preservation will never be wholly removed. At present it is impossible for your friends in Parliament to do anything for you. You can do much—I think you can do everything—for yourselves. Let it be a rule that no tenant farmer will support a candidate who is not in favour of full justice to tenant farmers, and the whole character of county representation will be changed. I would advise your committee to correspond with farmers in every county in the kingdom, and to exert them everywhere seriously to consider this great question, and to prepare to act when another general election shall take place. Your deliverance from the insulting griev-

ance of which you complain rests mainly with yourselves. I am, very respectfully yours,

JOHN BROWN.

Mr. A. Robotham, Oak Farm, Drayton Bassett,  
near Tamworth.

The VICE-CHAIRMAN said Mr. Bright's letter was for the most part a perfect piece of nonsense.

Mr. BROWN moved a vote of thanks to Mr. Robotham for his valuable paper—a paper which they would agree with him was forcibly and feelingly written. Game was considered a very great delicacy, and he had frequently been told that the game question was a very delicate subject, and that any attempt on the part of farmers as a body to discuss it would lead to very serious misunderstandings between them and their landlords. If ever there was a time when that bond of union which existed between landlords and tenants required to be strengthened, that time was the present. The tenant-farmers had for the last five or six years been labouring in vain with respect to this subject. We are unwilling to believe that a plain, straightforward, moderate, and respectful remonstrance respecting an undoubted grievance must necessarily bring down upon them the displeasure of their landlords. It was always pleasant to look on the bright side of any picture; and what brighter picture was there in this little England of ours than an English gentleman living in his ancestral home, surrounded by a grateful and a prosperous tenantry (cheers)? But while they could not but warmly acknowledge the efforts of such landlords to make the welfare of their tenantry their chief concern, there is no wisdom in disguising the fact that there were estates where the tenant-farmer, in his struggle for subsistence, met with very little consideration—where game accumulated and crops decayed, where the field-sports of landlords sometimes resembled the exploits of Cockney sportsmen among Cockney fowl, where the gamekeeper was monarch of all he surveyed, and was permitted to sour the temper of the farmer, to be the greatest annoyance of the farmer's wife, and the deadly enemy of her cats (laughter). He was willing to believe that, in some districts at least, these occurrences were more rare than formerly; still he would respectfully remind those whom it might concern that, while in this state of transition, hard-working men were being ruined, and their families reduced to poverty, and the working man was being deprived of his daily food. A dispute about game had come under his own observation this present season. The tenant was an excellent farmer, and laid out capital liberally—some would say lavishly—upon the soil, and the landlord was a man who wished to do his duty; but he had a gamekeeper, who resembled Cobbett's farm-waggoner—he not only managed the animals, but he exerted a pretty smart control over the owner of them; and the result was that a good landlord and a good tenant were brought into a state of hostility, and wounds were opened which it would be difficult to heal. With respect to the damage done by game, he met at different times during the present summer with two farmers from different parts of the country, and having got over the usual salutations about health and the weather, he asked, "How are your mangolds?" (laughter). They answered in pretty nearly the same words—"O, I shall have none; the hares ate them off when they were about as thick as my finger" (laughter). He would ask them who were revelling in the prospect of 30 tons of mangolds per acre, how they would like that? And he would leave it to people who were fond of calculation to say how many tons of mangolds each of those hares consumed whilst indulging in these finger luxuries, and how many carcasses of beef and mutton did they consume in the same time? (Hear, hear). Mr. Robotham had alluded to the late Lord Hatherton's statement, and there were few higher authorities on the subject than his lordship, according to whom high farming and strict preservation of game were utterly incompatible (Hear, hear). Now high farming meant more manure, heavier root-crops, better corn-crops, abundant supplies of beef and mutton; and if the promotion of these things and excessive game-preserving were utterly incompatible, he thought farmers ought to be pardoned for asking their landlords to take the matter into their serious consideration (Hear, hear). There was one point on which he differed from Mr. Robotham, and from very many of his brother-farmers, and that was respecting the "Night-poaching Act." He believed that every time a gamekeeper laid his hand on a poacher, he came in contact with a thief (Hear, hear); and he had no desire to encourage that class of persons. But it spoke volumes in con-

demnation of the game-preserving system, that made the tenant farmer look upon the midnight depredator as his best friend, and the thief-catcher as his most inveterate enemy (Hear, hear). He had heard tenant-farmers express their fears that the preservation of game would become more fashionable—that this excessive preservation and wholesale slaughter were indulged in by royalty. He could only say that, if such was the case, he could only hope that royalty would grow older and wiser, and that princes and nobles would enjoy the legitimate sports of the field, of which he was sure no farmer wished to deprive them, and that they would give up that wholesale butchery which reminded one of heroes crushing flies (laughter and Hear, hear). That the game-laws required alteration he thought was unquestionable; but he could not say that he had studied the subject sufficiently to enable him to propose a remedy, and he should therefore not detain the meeting longer.

Mr. H. OSBORN said he was pleased with the temperate tone that had hitherto pervaded the meeting, and he hoped it would be continued on to the close. He must say he rose to address them that day with a very strong conviction of the importance of the question they were discussing, and he was decidedly of opinion that the excessive preservation of game was fast assuming the dimensions of a national calamity, and he was quite sure it was fast undoing the ties which they all enjoyed formerly to see between the cultivators and the landlords of the soil; therefore he thought whether in towns or amongst the cultivators of the soil no more important question could be brought under their consideration. He was pleased with the notion Mr. Robotham threw out, and which was confirmed by Mr. Brawn, and which he could confirm by his own experience, that the preservation of game in many districts had been carried to such an excess, as to greatly increase the price at which meat might be provided for the labouring classes of the country. He thought their friends in town who were wondering the price of meat had got so high, might see some solution of the difficulty, when they knew that on many estates one half of the produce was frequently destroyed by game. The question had been looked at in several aspects; but before he went any further, he should like to make a remark on the letter they had received from their president, Mr. Chawner. No man had more respect for him than he had, and there was no one whose opinion he would sooner take on agricultural questions than Mr. Chawner's; but he thought there was a glaring error running through the letter he had sent them that day. He seemed to assume that every tenant farmer was just commencing his tenancy. Now he would tell them what was the position of the great bulk of the tenant farmers of the country. Every landed gentleman almost was connected with some agricultural association, at which he made speeches on various agricultural topics—on the necessity of improving the cultivation of the land. How was that to be done, except with an extra application of capital? They might go on a farm, and meet a landlord who would talk fair to their face, and tell them he would not allow them to have their crops destroyed by game. The tenant proceeded to lay out his capital on the land, and as soon as he was bound hand and foot to the landlord his crops were eaten up. If the preservation of game continued as it had done within the last few years, they might bid adieu to all improvements in agriculture, as he was sure the farmers could not continue to lay out their capital as they had hitherto done if there must be such a system, which was fast spreading. He did not make any charge against the great body of the land-owners of England. There was no one who held them in higher respect than he did, or who would sooner support them in their legitimate rights. Although he agreed with Mr. Bright in his detestation of the game-laws, he disagreed with many things in the letter that had been read from him that day. He for one was not prepared to identify himself with all the sentiments of that letter (Hear, hear). There was another aspect of the question—the mode in which the game laws of the country were carried out—that had not been sufficiently dwelt upon that day. It was a few individuals in this country who were by their excessive preservation of game giving such an impetus to the trade of poaching, and by holding out inducements to poachers, were manufacturers of thieves and criminals. They also caused a higher price of meat, threw an increased amount upon the poor's rates of the kingdom, and caused an immense amount of criminals to be kept at the ex-

pense of the rate-payers of the country. He thought the time had come when the farmers should make their voices heard, as they could not continue to cultivate the soil if one-half of the crops were to be destroyed; and when public opinion was enlightened in this country, and they knew the reason why the price of meat was raised to such an extent, they would soon have that opinion in their favour, and it would be said that to class of people should be able to keep up a code of laws that impoverished their fellow-creatures, added greatly to the criminal returns, and did no good to any individual. He had great pleasure in seconding the vote of thanks to Mr. Robotham.

The resolution was then put and unanimously carried, as which Mr. Robotham returned thanks.

Mr. OSBORN then proposed the following resolution: "That this club desires in the most emphatic manner to call attention to the serious losses which were being inflicted on tenant farmers in many localities by the excessive preservation of game, and to the necessity that exists for a general and earnest appeal to be made to landed proprietors in order to induce them to take immediate steps for abating the evil."

Mr. JOHN LOWE said the question as it then stood before the meeting seemed to him to be rather confused. He thought it should be discussed under two heads—firstly, the game laws of the country generally; and secondly, the preservation of game as between landlord and tenant. It would appear from what had been said by most of the speakers that they considered that the landlords, that was the game-preserving landlords, were responsible for the game laws. He thought that was not quite true. He was willing to admit at once that he believed the time had now come when a very great and important alteration in the game laws should take place. But, as he had said before, he thought they should distinguish between the evils occasioned by the game laws on the one hand, and those on the other which were owing to the disposition of the landlord. If they tried to make the landlords responsible for the game laws, he thought they would be trying to place upon the landlord's shoulder a greater burden than they ought to be expected to bear. He therefore hoped they would approach the House of Commons simply on the question of the game laws; and according to his notion the first approach to that House should be made by way of petition (Hear, hear). That course seemed to him to be the one which was at once the most legitimate under the circumstances and the most likely to produce what they all required, namely, a very extensive alteration in, if not the entire abolition of, the game laws. He did not mean to give an opinion as to whether their entire abolition was desirable or not; but unquestionably they required to be at least considerably revised (Hear, hear). Then, as to game-preserving landlords, they must be dealt with in another way. He thought tenants had the matter in a great measure in their own hands. They should refuse to take land from game-preserving landlords. [A MEMBER: It would not do.] He thought that so long as the farmers themselves were willing to take farms on which game was preserved to an improper extent, so long would the preservation of game have to be complained of by them ("No, no"). If there was not an anxiety to possess such farms, landed proprietors would alter their views and their course; but so long as tenants were willing and anxious to take farms, knowing that they were overstocked with game, he thought there was a good deal of blame to be attributed to themselves for the evils they suffered (Hear, hear). In his opinion the most effective way of endeavouring to get redress for this great grievance of the game laws was to petition the House of Commons to inquire into the subject. The resolution which had just been proposed was so much in accordance with his views that he had very great pleasure in seconding it (Hear, hear). He was delighted to find it was so politely worded (laughter and Hear, hear). That was the proper way to approach the subject (Hear, hear). He was afraid that some course hardly so well-considered and courteous might be proposed. He was bound to say that some portions of the paper read by Mr. Robotham were too plaintive, without being suggestive of how to get rid of what they had reason to complain of. But as the resolution was so moderate and so courteously worded and so much in accordance with his views, he had very great pleasure in seconding it. He thought the members of the club and all advocates of their view of the question now under discussion ought to make up their minds to keep most determinedly free of all political feeling on the sub-

ject (Hear, hear). It was not a question whether a bill should be brought in by a Conservative or a Liberal. The question ought to be discussed without any reference whatever to political matters, which were wholly beside and apart from it, and had no relation to it whatever (Hear, hear).

Mr. KING said he concurred in the resolution, and thought it a reasonable and straightforward way of introducing the grievance to the notice of those whose duty it was to redress it (Hear, hear). He agreed with Mr. Lowe that the question ought not to be allowed to assume a political aspect. If they could not look with confidence for justice and protection from noblemen and men of birth and education, he was afraid they would never obtain them from pretenders and upstarts (laughter and "Oh!") A MEMBER: "That is hard on Mr. Bright". Mr. Lowe thought tenants might redress their grievance wholly by refusing to take farms from game-preserving landlords. Mr. Lowe seemed to think that it was only the tenants who were liable to vicissitude, that landlords never changed. But he would remind Mr. Lowe that landlords were but tenants at the will of a higher Power than any on earth, and that they had to quit on very short notice. They did not always get six months; and their successors might be very different men from what they were. He had known many tenants who under their old landlord preserved the game on their farms and killed it or did as they pleased with; but a new landlord came in, and things were quite altered. It did not suit them to move off with their old landlord, and so in some instances they had had to endure vexations and losses and oppression. He referred to the tendency of excessive game-preserving to foster criminals by increasing the temptations to poaching, which always led to crime. He had seen enough of game preserving and its consequences to know that a game-preserving landlord was an enemy to himself, an injurer of his country, and the ruin of his tenantry and his neighbourhood. He hoped that meeting would not separate without putting on record a most emphatic protest against excessive game preserving and all the evils to which it gave rise.

Mr. BIGGE, agent to Lord Wenlock, said that at the discussion last autumn on the question of farm-agreements, a great deal was said about game preserving. After that meeting he thought a good deal on that subject; and as he happened, he was glad to say, to be in a position to try an experiment on the question of game as between tenant-farmers and landlords, he immediately set to work to put it in force on some estates in Shropshire which he had the honour of managing. The first thing he did was to discharge all the game-keepers on the estate (applause). Having done that, at the audit dinner he mentioned to the tenant-farmers what he had done, and he was glad to say it met with their full approval. At the same time he intimated to them that the landlord was fond of shooting; that he wished to reside on his estate, and wished to live in amity with all his tenants (Hear, hear). They one and all said they were certain they would preserve more game on that estate than the keepers did (Hear, hear). At the same time they had liberty to destroy, at every season of the year, by ferrets, but not to shoot on their farms. With this they were quite satisfied. This year there was an exceedingly good shooting season. Instead of killing 250 brace in a week's shooting, nearly 400 were killed (Hear, hear). That was a practical proof of what tenant-farmers, if they were treated in a liberal, straightforward manner by their landlords, would respond to (Hear, hear). He hoped the experiment would continue to be successful, and that, in future discussions in that club, he would have the pleasure of reporting favourably with respect to it (applause).

The VICE-CHAIRMAN: Were there more hares and rabbits on the farm than in previous years?

Mr. BIGGE: No rabbits at all, or very few.

The VICE-CHAIRMAN: Were there more hares?

Mr. BIGGE: There were plenty of hares for shooting.

The VICE-CHAIRMAN: The same as the year before the keepers were discharged?

A FARMER: They didn't want as many by a long way (laughter—Hear, hear).

Mr. BIGGE: It has been a bad season this year, but I think there have been quite as many.

Mr. BURBURY, of Kenilworth, said there was one phase of the question which had not been brought before the meeting—the sub-letting of manors (Hear, hear)—the owner letting the shooting of the manor to a stranger, whether the tenants were

willing or not. He believed that in law a gentleman taking the shooting of a manor was not liable to the tenant for the injury done by game. He believed an action would lie against the landlord, but not against the person renting the shooting. A great improvement in the law would be to make the owner of the game for the time being responsible to the tenant for damage done by the game. That would go a great way to remove an evil of which many tenants had now to complain. There was another question: he perceived that many gentlemen advocated a total repeal of the game-laws. Now while they were met there as tenant-farmers they should bear in mind the precept to do as they would be done by. They should imagine themselves in the position of owners of land; and, if they did that, they would see that with the total abolition of the game-laws would arise a necessity for a very stringent trespass-law (Hear, hear).

A MEMBER: A very good thing, too.

Mr. BURBURY: They should well consider the position in which they would be placed by a trespass-law of so stringent a character that it might be made to operate very vexatiously. Many of them were in the habit of occasionally crossing their neighbours' land. He knew it was the case in the neighbourhood from which he came. Now, under a very stringent trespass-law, they might find themselves brought up before a magistrate for crossing their neighbour's land. In reference to the sub-letting and shooting, he suffered severely from it himself. He should like to be able to go at the person shooting, for the damage he had done. He knew an action would lie against the landlord; but every one knew that actions by the landlords, whether successful or not, produced ill-feeling which led to notices to quit.

Mr. ROBOTHAM said he thought there would be very little use in appealing to the landlords: they should appeal to the House of Commons.

Mr. HOUGHTON: When the Edinburgh Farmers' Club discussed this question some time ago, they came to a practical conclusion. They decided upon petitioning Parliament; and the first and the main point upon which they petitioned was that hares and rabbits be dropped from the game list. Could not this Club adopt something of that sort, and second the endeavours of the Edinburgh Club by doing the same thing (Hear, hear).

Mr. T. D. LAWDEN: Suppose we succeeded in having rabbits and hares dropped from the game list, what would be the consequence? Landlords would simply say: "It is true rabbits and hares are not on the game list, but if you kill them nevertheless, you shall not remain on my property." If they could get landlords to see that it was not for their interest or that of their tenants that too much game should be preserved, they would have done all that was necessary.

Mr. R. H. MAFREN said he thought there was one thing in the question that every one ran his head against, which was that the tenant was the owner of the hares and rabbits, and pheasants as well. It was no use dividing the matter: the more they dissected it the more intricate they made it appear. When he took his farm and they took theirs, they took the hares and rabbits at the same time, until they committed their hands to paper which contained a clause to this effect, "That I reserve the hares and rabbits to myself." So that really and truly it was an act the farmer himself committed. The law of the land gave them to the tenant, who by his own act parted with it. That was the law, he believed. They had heard a great deal of the damage done by game; but there was other damage besides what had already been alluded to. To a great extent it was that waste of capital which debarred a man of industry from investing it in land without an amount of security for its proper return. They all knew he had spoken, written, and conversed on the game question again and again, and the question was spoken of at the time he read his paper on "The Tenure of Land" last December. That gave him an opportunity of a large correspondence with different gentlemen in various parts of England, and the disclosures made to him were such as he for one was not aware of. On one estate of 18,000 acres, the landlord had never allowed a reaping machine or a steam plough, and the tenants had been compelled to leave five feet of hedge-row for the preservation of game (cries of "Shame"). So long as that existed it was no use their talking about their grievances unless they came forward with some mode of redressing them. He was the last man in the world to wish to separate the interests of

landlords and tenants. He was proud to have an aristocracy among them who had found good farms and homes for hundreds of thousands of men. If the landlords were a different class of men as regarded birth and position, the condition of the tenants would not be improved. In the first instance, they heard, in the paper read that day, some startling assertions made. He wished to ask by whom was the land owned? Not by an old territorial possessor, but one who was a very few years ago in a very different position. It was one of Mr. Bright's school.

Mr. ROBOTHAM: It was not one of Mr. Bright's school.

Mr. MASFEN: There were exceptions to all rules. There were some of the aristocracy whom they felt proud to rent under, and others the reverse; but it was no use trying to set class against class to remedy that evil (Hear, hear). There was no remedy in that; but the remedy was to try to shun men who had made such restrictions to leave the hedge-rows five or six feet wider than others for the preservation of game, and who could not allow reaping machines or steam ploughs on their property. It was a happy thing for Old England when a landlord and tenant could agree and live together. His late landlord, whom he had great pleasure in finding sport for, told him he never enjoyed so much sport as he did after a discharge of his gamekeeper, and made him and his labourers preservers. He was happy to say there was an example in a neighbouring county of a large landed proprietor acting up to the views of an humble individual like himself, in giving orders to his agents to discharge his keepers and put his tenants in charge, and there had been an increased amount of game killed this year, something like 70 per cent. It was not when the game was in the hands of the first party that damage occurred, but when it was in the hands of a third. A tenant naturally felt a desire to find his landlord sport, but he did not feel inclined to find it for a man who offered so much for as much as he could provide. There was another instance, and he was sorry to say he suffered from it. They knew well there was no mutual tie of good feeling between a man who farmed land under a landlord and the man who took the game upon it. He went for mere sport—for preserving the game to the utmost and destroying the greatest amount of head he could. Those were grievances under which they all had to suffer. After a man had been called upon to pay the greatest amount for rent, then to be compelled to find the greatest amount of game for a third party, was, he thought, against the idea of every free-born Englishman. Mr. Robotham, in his paper, related to the amount of food they would be able to produce, supposing the game was cropped down to a quarter the extent it was now. He had stated the amount that might be produced in beef and mutton, but he did not say the amount in an acre of corn that might be produced if game were not preserved to such an extent as it now was. He dare say they remembered the case he referred to, during the discussion on the "Tenure of Land," of a farmer in Wiltshire who fenced off a portion of a field, and had more in that portion, by three times the amount in proportion, than in the remainder of the field, when it was thrashed. How far would that have gone if they were to have the hares and rabbits pretty nearly annihilated? He did not want to see so many hares and rabbits as they had. He did not think the winged game so prejudicial, and they had no objection to find sufficient for the sport of their landlords, but not for battue-mongers and professional poulterers. As regarded the proposition of dividing the hares and rabbits, he could not say he was satisfied with it. He believed the proposition put by the club some time ago by Mr. Bigge was more to the purpose—that if they were to pass a resolution requesting the landlords to sweep from the earth that baneful nuisance gamekeepers, they would do an immense amount of good (Hear, hear).

Mr. ROBOTHAM said, with reference to Mr. Masfen's remarks, if they would remember, he stated in his paper, with reference to the large quantity of grain destroyed by hares and rabbits, that he should leave it to other gentlemen better able to point out. He did not intend to point out all their grievances himself. His friend Mr. Masfen had pointed out the other portion, and he thanked him for it.

The resolution was then put, and carried unanimously.

Mr. OSBORN said he had one other resolution to propose, and it would rather complete the matter if they were to pass it that night. The resolution was: "That the excessive preservation of game is not only injurious to the tenant-farmer, but at the same time is a fruitful source of crime,

entailing a great annual loss in prosecutions, which are increasing from year to year; while the game-laws at present in force are most objectionable, as leading to the opinion on the part of a portion of the population that those laws are the result of class legislation, and prejudicial to the welfare of the country at large." With respect to the expense of prosecutions, he stated that during the past year there were more than 10,000 prosecutions for infraction of the game-laws. He did think that those persons who preserved game to such an extent, especially rabbits, were responsible to the country for the excessive amount of expense incurred in those prosecutions (Hear, hear).

Mr. T. B. WRIGHT seconded the resolution. He said he was disposed to take a more hopeful view of the subject than some of the gentlemen who had preceded him. He should not say much with reference to the letter of Mr. Bright, because probably it went more into politics than was consistent with the character of that club. (Hear, hear.) The reference Mr. Robotham made to Lord Hatherton's opinions was to be found in an article written by Mr. Bright in Morton's "Encyclopedia of Agriculture." They all knew the admirable example set by Lord Hatherton in respect to game preserving. His lordship soon found out that to farm properly it was necessary to give up game preserving. The article in the "Encyclopedia of Agriculture" was brief, but it took up nearly every point, and, amongst others, the one in the resolution which had just been submitted for the approval of the club, the increasing number of prosecutions. As Mr. Osborne had told them, that evil had been on the increase from year to year. He did not think he ever read an article which put the whole question in a better way than it was put in the article by Mr. Bright; and he was bound to give this expression of opinion with regard to it. He thought they might look hopefully to the future. Lord Hatherton set the example 20 years ago. Mr. Randall of Chadbury, near Evesham, said distinctly, in a discussion which took place on tenant right, that on some of the estates which he managed in Worcestershire no game was preserved, except winged game. That was an instance of progress.

A MEMBER: It is very slow.

Mr. WRIGHT: Probably a number of other instances might be mentioned. Reference had been made to some landed proprietors who would not allow a steam-plough or a reaping-machine on their estates. But they knew very well that such landlords were exceptional, because steam-ploughs and reaping-machines were made every day, and they were not made for show, but were sold and used. He knew a tenant farmer who declared with tears in his eyes that he would be ruined by excessive game preservation. Yet there had been a considerable improvement during the last 20 years. (No, no.) He quite agreed with Mr. Masfen that the way to extend improvement in agriculture and to increase the prosperity of tenants and landed proprietors, and the welfare of the labouring classes, and of every class of the community, was to foster feelings of confidence and good-will and mutual respect, and to show that the interests of landlords, tenants, labourers, manufacturers, and all other classes were one. The resolution which had just been proposed seemed to be very temperate and just, and he had great pleasure in seconding it.

Mr. ROBOTHAM proposed, as an amendment to the last resolution, "That the present system of holding farms wherein the landlord exercises the sole and exclusive right to the game is strikingly selfish and unsatisfactory, and in its operation exhibits the fallen and servile condition of the tenant-farmer in submitting to the powerful but unjust dictation of the landlords as exemplified in their one-sided and unnatural agreements, leading to a great imposition and ill-feeling, that frequently terminates in the ruin of tenants. The system called aloud for the exercise of the joint and mutual co-operation of all parties interested by restoring proper independence to the farmer, and rescuing their property from destruction."

Mr. SYDNEY said: In taking a farm he had no restrictions as to game, or any other nonsense. That evil and nuisance rested entirely with the tenants themselves. He was desirous of taking another farm, for his son, and he had had the refusal of several good farms, but he had declined them on the score of the blackguard game question (Hear, hear). Were they to go on in that state of things, and beg the question from the landlords and aristocracy of the country? He was not for begging the question at all. When he took a farm he intended to pay the rent, but he did not intend to keep another man's



stock. Pretty well if he paid his way, which of late years farmers had some difficulty to do. They all understood that the question was one of rent, after all was said and done; therefore he agreed with Mr. Chairman that the game question was a question of rent; and if they were determined to take those game-preserving farms they must go about it in a business-like way, and say, "Now this farm is inundated with game, therefore I will not take it unless I can have it with the rent accordingly."

Mr. MAY: No "unless."

Mr. SYDNEY: But they took the farms, and grumbled afterwards. Now, he wanted them to do all the grumbling first. If they would all act on the principle of not taking those game-preserving farms, they would have nothing to complain of. He hoped in what he had done he had set an example. He would not take a farm under a game-preserving landlord. After one of their previous meetings, during the tenure of land discussion, he had the honour of riding with Lord Lichfield, and the whole conversation came up. His Lordship said he (Mr. Sydney) could not expect to take a farm on the conditions he had stated. And he replied, "Of course he did; and he had got one; and no doubt he should take another." He farmed to the best of his ability, and spared no expense; but tell him he was to have his crops destroyed by vermin, and he said he would not. And so he told Lord Lichfield that he would shoot any mortal thing that ate his crops. He assured them what they had to do was to make a firm stand, and not take the farms if they were to be robbed (he could give no better expression to it than "robbed") (cries of "The right term") of their property by the unlimited support of game. How many tenants were there who took farms with a limited quantity of game, but in a short time the game increased tenfold? They then went and lodged a complaint against the game, and the landlord told them if they did not like the farm they might leave it. That was very nice satisfaction for a man who had laid out all his capital and made all the improvements he could, expecting to stay some time! He (Mr. Sydney) said they ought to do away with such rubbish. They should not take a farm under a game-preserving landlord till they had mutual covenants with the landlord for game. Say to him, "I don't want to deprive you from coming on my farm to sport: I should be glad to see you every day; but so long as I keep this stock why should you deprive me from sporting? Do away with your keepers, and I will answer for sufficient sport."

Mr. JOSEPH WRIGHT, of Etwell, thought the question had been treated well, and with a deal of delicacy by the Club. If there was time he could keep them the whole of the evening, telling them of disasters that had befallen himself; but he had heard so much of damage done that it would only be a tale

told over and over again, which he had no wish to do. He did not think it would answer the purpose of the Club to adopt the resolution of Mr. Robotham, as he thought by that means they would make very many enemies and very few friends. They were making progress, but very slow indeed, because they only found two or three landlords who had fallen into those liberal views during the last twenty years; during which period how many tenant-farmers had been ruined! He thought they ought to act as temperately as possible in introducing the question. He agreed with Mr. Sydney in not taking game farms, and he had given one up himself on that account. He thought he had sufficient capital to stock the farm, and would not trouble his landlord (Hear, hear). His friend Mr. Robotham had instanced Lord Stamford in his paper. He had no occasion to have gone that distance. He might have taken an instance in his own locality, where there had been more than £2,000 a year taken out of the pockets of a tenant by a landlord, by the preservation of game. It was time some alteration was made, and it was necessary they should go tenderly to work, and he did not think that was the proper time for them to adopt Mr. Robotham's resolution. Everybody interested in that great question must have seen lately the immense amount of money sent out of the country for foreign corn, and at the same time those hares and rabbits had consumed as much food as was necessary for the support of the labouring population. Mr. John Bright (for whom he had the greatest respect possible) seemed to think the question should be reserved for the next general election. He (Mr. Wright) thought the time was come, now they had a new Parliament, when their grievances should be laid before them in the shape of a Bill of Tenant Rights. He was sure they had got new members who would take the matter up, and some measure would be adopted on purpose to carry out their wishes; and he thought they would be able to satisfy the game preservers, that if they did continue to preserve it, the people of this country would not tolerate it any longer, causing loss to many of the farmers now in the country, and in many instances throwing their families into want. He had no doubt Parliament would pay great attention to their petitions.

After some further discussion, Mr. Robotham agreed to withdraw his amendment till the original motion had been decided upon.

The original motion was then carried with only three dissentients.

The amendment of Mr. Robotham was then put as a substantive motion, and negatived by one vote; but it is only just to say that at that time the meeting had dwindled down to a very small number in consequence of members having to leave for their respective trains.

A vote of thanks to Mr. Osborne, who had taken the chair terminated the proceedings.

## INAUGURATION OF THE STATUE OF DAUBENTON.

[TRANSLATED FROM THE "JOURNAL D'AGRICULTURE PRATIQUE."]

Less fortunate than Olivier de Serres, Buffon, Mathieu de Dombasle, and Gasparin, the modest Daubenton has long awaited his statue; but he has it at last. On Sunday, Nov. 13th, 1864, in spite of wind and rain, it was inaugurated in the Garden of Acclimatization, Paris, in the presence of a numerous, but respectable company, proving by their frequent applause that they sympathized in the homage so tardily rendered to that savant.

It is well known that Daubenton, born at Montbard, 1716, was the compatriot, friend, and fellow-labourer of Buffon. He first studied medicine, but afterwards abandoned that science to work and study with the illustrious author of "l'Histoire Naturelle." He furnished to the first 15 vols. of that great work some articles upon anatomy, written with scrupulous exactness. His descriptions are justly regarded even now as true master-pieces, and serve as the bases of comparative anatomy. In 1745 he was appointed guard and conservator to the Cabinet of Natural History, and in 1778 became professor to the College of France. His instructions there were eminently successful. His simple, clear, and precise manner of explaining soon initiated his auditors into

all the secrets of natural history, and he became very popular. He was appointed to succeed the great Cuvier. In 1785 he was nominated professor of rural economy at the School of Alfort. The Academy of Sciences soon opened its doors to him, and he furnished to that august assembly numerous papers, as well as to the *l'Encyclopédie* of d'Alembert and Diderot, who was a very enthusiastic coadjutor. He died in 1800, in full age, quite obscure, and almost forgotten. Old age is often a first death, physically and morally. His reputation was for an instant effaced by the brilliant glory of Buffon; but posterity is never ungrateful; it assigns to each its place, and renders to those who deserve it their share of immortality.

Daubenton rendered special services to agriculture by acclimatizing Spanish merinos in our country (France), and it is chiefly for that reason that his statue is placed in our Zoological Garden. He is represented standing, slightly bending over a sheep which he is caressing, and surrounded by the implements of husbandry. M. Godin, sculptor of the monument of Amyot, erected at Melun, has shown much talent in the rendering of this able, yet graceful figure.

In the absence of M. Drouyn de Lhuys, the president of the



society, the ceremony was presided over by M. de Quatrefages, professor-conservator of the Museum of Natural History, member of the Institute, and vice-president of the Acclimatization Society.

A tent of brilliant colours was erected in the Garden. The members of the council first took their places upon the platform, then Messrs. A. Passy and Ruzé de Lavison. In answer to the applause of the crowd, the cloths which covered the statue were removed. The band of the Guard of Paris played, after which the choir of the children of Lutèce struck up the Song of the Labourers and the Shepherd's Song, those remarkable productions of Laurent de Rillé. M. Quatrefages then rose, and delivered the following speech:—

"Gentlemen,—Returning after a long absence and very important occupations, I find myself quite unprepared for the honour put upon me—that of presiding over this ceremony. You are aware that his Excellency M. Drouyn de Lhuys, being detained by most important duties, is unable to take his part on this occasion, which crowns the whole of the proceedings in which your president has had so large a share. I regret his absence, both on your account and my own, for by it we lose one of those addresses, so full of life and heart, to which we are accustomed, and which certainly cannot be replaced by my unprepared words.

"Daubenton you know was the compatriot, fellow-labourer, and friend of Buffon. An equal love of science, and a similar ardour to sound the mysteries of nature, were the bonds which united these two men, so different in most respects—a union which for many long years was devoted to the service of genius. Sometimes too bold, but having an exact mind—patient, conscientious—he was determined to seek and find those precise facts without which the most apparently beautiful conceptions are only too often worse than useless.

"In that association, the functions of which he filled at the Jardin du Roi, now the Museum, Daubenton accepted a most subordinate post. Far from complaining, he seemed pleased with a position that, whilst it shielded him from notice, placed in his hands many scientific treasures; but the work brought him to the light which soon struck every eye, and honours quickly came to seek the modest 'démonstrateur du cabinet d'histoire naturelle.'

"The Academy of Sciences also soon enlisted him into its ranks. They were justified in choosing him by the part Daubenton had taken in Buffon's work, and still further by a series of important papers written by him upon pure science. After a while, the desire to be useful induced Daubenton to engage

in another order of researches. He endeavoured, by applying himself to the study of physiology, to discover the means of acclimating better races of foreign domestic animals, with a view to improving our indigenous breeds; and the same basis which had assisted in sounding the depths of comparative anatomy wrote 'Instruction pour les Bergers; et le Mémoire sur le premier drapeau de laine superfin du cru de la France.'

"These works of so varied a character give to the historical figure of Daubenton a double physiognomy. First, we have in him the savant, properly so called—eminent, no doubt, amongst his contemporaries, but whose glory paled a little by the reflection of the halo which spread around the name of Buffon. Then we have the savant who applies science to public benefit, and takes under that title an elevated position apart from others. Contemporaries themselves understood that they had there, so to speak, two men in one, and knew how to honour both. For the first they appointed him to the chair of natural history at the College of France; for the second he was chosen by the School of Alfort as professor of rural economy.

"And now, gentlemen, we in our turn pay to the latter a solemn and well-merited homage. As the representatives of posterity, we to-day sanction the judgment held by our fathers. Far be it from me to establish a comparison in every respect—that would be impossible; but when pure science has nobly acquitted its debt towards one of its most glorious representatives, by placing the statue of Buffon in the Jardin des Plantes, it is natural that applied science should pay hers by raising the statue of Daubenton in the Jardin d'Acclimatization. The thought which originated in the bosom of our society, stated by our honourable vice-president Richard, is at last realised, thanks to your concurrence, gentlemen, as well as that of numerous contemporaries who have assisted in our work: let us congratulate ourselves upon the result.

"It proves at once that in France no true merit can pass away unacknowledged, and that everyone who devotes himself seriously to the service of his country or humanity will sooner or later receive a just reward."

M. Richard (of Cantal) and M. Viard, mayor of Montluçon, the country of both Daubenton and Buffon, afterwards spoke in honour of the man who had done so much good by the introduction of the race of merinos into France.

We like to give verbatim the whole proceedings of such ceremonies, and show that we never forget those who during their lives render services to their country and humanity.

GEORGE BARRELL.

## OUR CATTLE ECONOMY.

### OUR FOREIGN CATTLE TRADE.

Speaking in the mildest terms applicable to the occasion, our trade in foreign cattle is anything but creditable to the country. The home trade is bad enough—sufficient to make an intelligent agricultural public blush; but the traffic between England and the continent of Europe in live stock is many degrees more reprehensible; and what makes it all the more to be regretted is the fact that its objectionable features are daily increasing in number and magnitude, faster than the means used to effect a change to the better; so that, generally speaking, the trade is moving from bad to worse. We are all familiar with the "Dog Days," and the changes that take place in the blood of hunted and affrighted animals, but sadly neglect the practical lesson which they teach, in reference to the marketing of our cattle; for if the canine race and hunted and affrighted animals suffer so much from the extremes of summer-heat and nervous and other excitement, it is but reasonable to suppose that similar causes acting upon fat stock and milch cows is by no means favourable to health during the hardships they experience in marketing; nevertheless British capital has but one rule for all temperatures, the management of stock during summer, winter, and autumn being upon a par. Happily, the fat-stock trade is fast being superseded by the carcase trade, and the growing prevalence of contagious diseases is rapidly affecting the transition which is thus taking place; for, with all the short-comings that are yet experienced in the conveyance of

carcases by rail and sea, they fall infinitely short of those sent under the live-stock trade.

What reason has hitherto failed to do, the cattle-plague promises soon to effect. A very large proportion of the fat stock sold in the Metropolitan Cattle Market is bought by intermediate jobbers or middle-men, for the carcase trade and the country. It is hardly possible to imagine a system more calculated to generate and spread contagious diseases like the various kinds of murrain. To this head of the subject we shall return when discussing the character of the cattle plague, and the means of its spread and prevention; meantime we shall only toss to the winds the fallacious notion now being crammed down the throats of a too credulous public, that the embarking ports of the continent of Europe are free from cattle-plague; for how could diseased cattle and disease-carrying things pass through a country without spreading the contagion far and wide? Supposing the state of both atmospheres equal, the contagion has had more time to spread at the embarking ports than at the disembarking ports, and without fear of contradiction we do not hesitate to affirm that the facts of the case will bear out the soundness of this conclusion. But to return to the middlemen.

\* "Instructions to Shepherds; and Memoir on the fine cloth made from superfine wool grown in France."

jobbers for the carcase trade—the prevalence of contagious diseases is proving a windfall to them in the outset; but, like the plague itself, it will eventually prove the contrary; and if railway companies and steam-boat companies would improve their methods of conveying carcasses, there would soon be an end of fat-stock markets altogether. Moreover, improvements like those in question ought to be enforced by statutory means, if they cannot be effected otherwise by professional skill and enterprise; for the time has obviously arrived when the work of progress must be commenced, and prosecuted in a manner becoming the age and the occasion.

We dislike statutory interference in questions of progress in the march of any branch of physical science; but as "there are exceptions to all rules," it certainly would not be beyond the urgent demands of the question at issue were the Legislature to prohibit the importation of live stock from the continent of Europe in the sailing-vessels and steam-boats now employed for that purpose; and the same or a similar rule might be judiciously applied to the sea conveyance of cattle generally, and suitable premiums offered in both cases for the efficient conveyance of carcasses. In other words, the statutory prohibition would extend to all vessels not built and fitted up expressly for the sea conveyance of cattle in *stormy weather*, all such vessels being duly registered and licensed for this purpose, and under a properly organized staff of control and management. Improvement in the conveyance of carcasses ought also to be enforced. Moreover, some such statutory means are at the present time necessary, to justify the investment of capital in an enterprise of this kind; for so long as the present system is tolerated, short-sighted and unprincipled dealers in live and dead stock would, or rather will, be induced, by "penny wise and pound foolish" calculations, to continue their present practice of shipping live stock, carcasses, &c., thereby keeping both the buying and selling markets in a foul, contagious, and unsettled state.

But apart from such statutory means, and the force of a barbarous practice with which those engaged in it have become naturalized, so to speak, there is (confining our remarks to the live-stock trade) already an open and inviting field for the safe investment of capital under an enlightened and judicious system of management—the field of enterprise being of sufficient length and breadth to guarantee an increasing and remunerating trade, for vessels could be so constructed as to carry either live stock or carcasses. We here allude more especially to the shipment of the better class of stock, which is able to pay a somewhat higher fare than the present charge, provided they are shipped in a proper condition, and yet leave their owners the gainers in the end. The rag-tag description of stock is but a losing lottery at the best—the least of two evils as a sacrifice of necessity, that the continental farmer, like the home farmer must submit to; thankfully pocketing the proceeds, however small, as better than no returns at all, or next to nothing, at home. All such riff-raff ought to be wholly excluded from the English markets, so that were they once virtually separated from the healthy thriving and better class of animals by those wholesome laws of commerce that regulate trade, the shippers of such cargoes, and also the owners of the vessels carrying such cargoes, would both find it a waning and losing concern. The owners of such craft, whether sailing vessels or steamers, may struggle on, and even fight for a hopeless and miserable existence, so long as they can keep their craft afloat; but this old system, like all other antiquated systems, would fast die out in many individual cases prematurely, for all new vessels would be built upon the most improved plan, overcrowding being prohibited. In short, the enterprise only requires to be fairly started on a scientific basis, according to the requirements of cattle, in order to carry successfully with it the whole of the import trade in cattle in the march of improvement; for it would be the height of commercial absurdity to suppose the contrary—that continental farmers and cattle dealers would continue to submit to the present sacrifices in order to uphold an antiquated sea-faring craft, were they in possession of the improved system of shipping in question, so as to obviate the heavy losses they now experience—losses that have hitherto been annually increasing in amount, and which, at the present time, are so ruinous as to threaten the extermination of the trade altogether.

These observations apply to the shipment of Scotch and Irish cattle, as well as to the import of stock from the continent of Europe. Improved cattle-steamers from the north,

including a more scientific system of management, would no doubt have to compete with improved methods of railway conveyance, and the rapidly-increasing demands of the carcase trade; but from the sister-country, Ireland, which is naturally a cattle-growing country, and which ought to supply the English market with a greatly increased amount of live-stock, more especially neat cattle, there would be a regular and increasing import trade. The proposition of growing beef for the English market may not as yet be a very popular one in the Irish ear, generally speaking; but it is high time, and, in point of fact, the more intelligent Irish farmers are already beginning to look to their own pockets as the true index to the course of action which they should professionally follow. If they can get a higher price in the Irish markets for their beef, then let Irishmen consume it at home; but if they can realize more in the English market, then let the pecuniary balance decide the practical question at issue. When seen in its own light, the solution of the question is about as simple on the one side of St. George's Channel as the other. Hence the practical conclusion at which the farmers of the sister-country are now fast arriving. Hence, also, the stimulus which an improved method of cattle management and shipping, and a higher price for fat stock, would give to the natural and legitimate resources of Irish industry in general, and to Irish agriculture in particular.

In the discussion which is now taking place in the columns of the political press, parties are obviously falling into several practical omissions—omissions no doubt naturally liable to be fallen into, under the peculiar circumstances of the case, but just so much the more necessary to be avoided in the investigation of so important a national question.

*First.* There is a manifest disposition on the part of those professionally engaged in the foreign cattle trade to overlook, or pass over slightly, if not to conceal as much as possible, the barbarous treatment to which cattle are subject on the continent of Europe before they reach the port of embarkation—to overlook the effect which such treatment produces upon animals, together with the actual position they are in, and how much it unfits cattle for shipment and the English market.

*Second.* There is a prominent tendency also to examine from two opposite extremes the progress we have made in shipping cattle—one, the seafaring party, asserting that because their steamers are now built expressly for the purpose of conveying cattle, therefore they erroneously conclude that they are everything that can be desired, both as to the accommodation which they afford to cattle and the management of cattle while at sea; while the opposite party assert with equal zeal and confidence that almost all the injury which foreign cattle sustain is effected on board ship, and in shipping and discharging, the whole seafaring part of the cattle trade being throughout barbarous in the extreme.

*Third.* The condition in which foreign cattle arrive in England and the treatment they afterwards experience are also viewed in two opposite extremes, the too apparent aim and object of those engaged in the trade (both seller and buyer) being to turn the penny to the best advantage out of the stock, such as they are, without regard to sanitary consequences that lie beyond the immediate routine of the market-day; the greater the number the drover drives, for example, and the salesman sells, the higher their pay, and so on; while those who are getting their fingers occasionally burnt are blowing the trumpet in the opposite extreme, as if the barbarous and antiquated character of the trade was the instrumental cause of all the maladies cattle now experience.

*Fourth.* We look in vain from beginning to end of the discussion for anything being practically done to determine philosophically what "the two Russian cattle plagues," and the other contagious and deadly maladies introduced from the continent of Europe, really are, and how far they differ from English maladies, with a view chemically to render the infectious poison, home as well foreign, innocuous by means of an antidote. Goats eat some plants that are very poisonous to the generality of animals, without experiencing any harm, because they contain in their system naturally something that acts as an antidote, either by decomposing the poison, or by repelling it along the *prima viæ* or the other excretories which it may enter. For a similar reason the infectious matter of the steppe murrain is, according to the general testimony, harmless when applied to the pig or horse. Now what is being done to determine the philosophical reason why? Obviously nothing.

On the contrary, is not the very reverse of this old established scientific rule the practice which medical men and veterinarians are doing their best to follow, as if curing maladies and not preventing them were their exclusive profession?

A very short practical *exposé* of these four shortcomings is all that is necessary. If those professionally engaged in the foreign cattle trade cannot supply the English market with healthy animals and wholesome meat, the sooner they are keeled across both buttocks and their places supplied with nationally trustworthy, intelligent, qualified persons, the better; and this applies with greater force to the English portion of the trade than to the foreign department of it. The facts of the case at the present time are so glaring and unpardonable as to exclude either from offering a single sentence in justification of their conduct, shipper or buyer.

Irish agriculturists and the French government are right. "Desperate diseases require desperate cures" it is said, and the indescribable state of the abnormal condition of the foreign cattle trade at present imperatively demands that the whole trade be made to ride a testing quarantine some way or other, until it has completely recovered, and is again in a position to supply the English market with none but healthy animals. The moment that contagious diseases, such as the cattle plague, are imported into England and appear in the English market, that moment the foreign trade in cattle should be prohibited altogether for a time, until disease has exhausted itself on the continent of Europe. The loss to those engaged in the trade, English and foreign, would no doubt be heavy and ruinous to not a few. But is not this what the foreign cattle trade justly merits? and, we may add, the only remedy adequate to effect a cure and establish permanently a healthy state of the trade. Upon the whole England would be a gainer, for the loss the English farmer has sustained is incalculably great. As to a supply of animal food for the English market, to this subject we shall return under a different heading, viz., "Foreign Carcase Trade;" meantime we would purposely avoid uncharitable reflections towards the continental stock farmer and his representatives in the live stock trade; but the fact to which we allude, viz., the heavy losses of the English farmer and public generally cannot be concealed as being so many gains to them, for the immense reduction of the home supply of meat is greatly increasing the demand for and trade in foreign stock, so that those engaged in the latter, the foreign trade, have an interest in the losses of the English farmer. And this too is not all, for there are a certain class of officials who have a professional interest in propagating disease, for the greater its amount the more employment and pay they receive. Is this as it should be? What can be more ridiculously and even culpably absurd than the manner stock are now being examined and passed by veterinarians at the embarking and disembarking ports? Equally absurd and culpable is the breathing space afforded to stock on board steamers, without any regard to their individual requirements from the peculiar state they are in. "This lot must be passed as healthy, and can be shipped at so much per head; and so must that lot, and the next following;" and thus the objectionable elements of an abnormal trade work together for the ruin of the English farmer and the general loss of the English public. So long as the old cuckoo song rings in the ears of Dutch and Russian bores, that "*anything will sell in the London market*," and so long as all sorts of live trash is weekly sold in the London market, what else can the English farmer and the English public expect but the importation of the maladies to which such a species of stock are naturally liable? for it may not inaptly be said that the cause of their rag-tag condition is the lurking of the seeds of disease in their system—life struggling in vain for the mastery over an insipient poison, as it were.

#### HOME CATTLE TRADE.

There is no department of farm practice that has been allowed to fall so far behind, in the march of improvement, as the marketing of live stock, more especially fat cattle and milch cows. All practices are said to be subject to improvement, and there are very few branches of industry that have not made numerous advances during the currency of the present century. We are, however, every day reminded that there are exceptions to all general rules, and the commerce of cattle is evidently one, for it is in a less advanced state to-day than

it was in a hundred years ago, both as to the health of cattle and the quality of the carcase.

It is easily accounting for this retrograde movement in the commerce of cattle, when the facts of the case are closely examined from a sanitary and practical point of view. Thus, although live stock of every kind are more uniformly and better kept throughout the year, and although breeds are greatly improved as to early maturity, symmetry, and carcase weight, animals are nevertheless more delicate in constitution, and much less able to bear the hardships of marketing, than formerly, when they were not only older, but in the enjoyment of a higher degree of that "rude health," as it is termed, so essentially necessary to their conveyance, whether by road, rail, or sea; for animals in the enjoyment of this "rude health" are invariably ready for their food, whereas our modern oilcake-pampered and extra-fat cattle are almost always "off feed" during the long course of hardships they have to experience when sent to a market at a distance from home. In the olden time, when broad grassy road-sides and numerous commons and baiting grounds everywhere abounded, it was no infrequent thing for a skillful drover to deliver his stock in a distant market, in better condition than when they left their native grazing grounds. Under good management, hardy Scotch lean and half-fat stock used to generally improve in coming up from the far north to the English markets. The feet of cattle grow tougher and harder as they grow older, hence the feet of old cattle are better able to support the weight of the body than those of young beasts forced forward to early maturity. Exactly the same thing may be said of their bones, joints, and tissues. At present the reverse of all this is the case, for commons are enclosed, baiting grounds are annually getting farther and farther between, roads are getting narrower and harder, while the feet, bones, and joints of cattle are softer and less able to bear their weight, which later (*weight*) has at the same time greatly increased. Hence the practical conclusion. The surprise is that our modern improved breeds of cattle, both oxen and sheep, are able to bear up under the hardships they are called upon to endure; for although railroads and steamboats convey them a distance in less time, yet the length of time during which they have to stand upon their feet without being allowed to lie down, rest, and recruit their exhausted strength, is far greater than formerly. Add to the above the greater number of markets, and cattle collected together, and the finale is conclusive.

The changes which have thus taken place in the conveyance and marketing of cattle increase the liability to generate diseases of a typhoid character, and to spread contagious diseases of every kind, especially rinderpest or steppe-malaria, and the like, whose contagious fomes are given off from the lungs, skins, &c., of animals labouring under such diseases, and are carried from one victim to another suspended in the atmosphere. As we propose offering a few practical observations on those contagious maladies in a separate paper, we shall not speak more of them here, further than to say that the generation of miasm and contagion, and their buoyancy, malignant character, and spread, are manifestly subject to the same physical laws as all other gaseous matters of a kindred character are; and, consequently, that the force and effect of contagion must always be directly as the crowded state, relaxed and prostrate vitality, so to speak, and delicate constitutional health and tone of nerve generally of cattle; but inversely as the cattle are single and enjoy free air, an active robust vitality, with an overflowing redundancy of "rude health." For, in the former case, there exists between the bodies of animals and the contagious matter in the atmosphere, or in any other medium by which it is carried, an attractive force; whereas, in the latter case, the force that exists between the bodies of robust healthy cattle and the contagious matter is, we aver, of a repulsive character. Hence the difference.

Such being the facts of the case relative to the peculiar position of trade, it is natural for butchers who are guided by experience to increase their weekly demands upon the dead-meat market, and to reduce their live-stock purchases. At a time like the present, when cattle-plague and sheep-pox prevail and are spreading to an alarming extent, and when the provinces are in a state of excited convulsion, butchers who can get a daily supply from the dead-meat market to meet the daily demands of their customers would be blind to their best interests were they to purchase only once a week, and then keep a stock of fat beasts on hand when dairy cows on every

hand are labouring under plague, the atmosphere being literally a putrid sea of pestilence. According to the laws and economy of commerce, it is the seller who must run and bear the risk of the heavy losses which the keeping of a stock of fat beasts on hand involves under the peculiar circumstances of the case. Hence the reason why farmers are not pocketing the long prices now paid by consumers for their beef and mutton—a large double-risk profit, so to speak, or the difference in question being pocketed by the middle-men jobbers, who purchase and slaughter for the carcase trade—a craft whose purchases of live-stock and sales of dead meat are increasing with the prevalence of disease amongst dairy cows, as well as amongst fat stock.

The above observations apply with equal force to home and foreign cattle, a very large proportion of both sent to the metropolitan market being bought by a middle-class system of jobbing for the carcase trade, and a very disreputable system of jobbing it is. It is not to be inferred from this that we are indirectly saying that either cattle salesmen or carcase salesmen, or the middle-men jobbers that fill up the commercial gap between, are dishonest in their transactions, nor do we even insinuate that they are a class of men that are over-well paid or that require sharp looking after. People have a right to live by their profession, whatever it may be, and we aver that the profits of the middle-men jobbers in question are not greater than the precarious nature of their trade and the heavy risks attending it demand. What we simply wish the reader to understand is that the middle-class jobbing system should not exist at all, for if livestock salesmen cannot dispose of the farmers' fat stock to butchers, the obvious interest of the farmer is to slaughter his fat cattle at home, and forward the carcasses to a dead-meat salesman, and thus save the extra expense attending the marketing of live-stock, including the charges of the live-stock salesmen, and the extra profits of the middle jobbers, &c.

The reader will thus perceive that it cannot be said our cattle trade is in a very healthy state, in more respects than one. It will also be seen that the commercial malady is of a character that must eventually work its own cure, or rather we should say is fast curing itself; for the supplies of dead meat sent to the capital, and to all our other large towns, is annually increasing more and more rapidly, and the growing prevalence of contagious diseases is adding fresh speed to the accelerated velocity of the commercial change which is thus taking place, as already stated.

Besides the middle-class jobbing there is another feature of our fat-stock markets, which is of itself sufficient to effect the change from the live-stock to the dead-meat trade. We allude to the rapidly-increasing demands upon weekly markets, and the manner they are fast overgrowing the possibility of supplies to meet the requirements of consumers. The daily demands of the latter (consumers), according to the economy of commerce, for example, require daily supplies, to meet which daily live-stock markets are for a similar reason essentially necessary; otherwise, a general loss must inevitably be sustained by the producer, viz., the farmer—a loss which he in more enlightened times will unquestionably learn to save; for, with the growing prevalence of contagious diseases, the magnitude of this loss is becoming something incredible.

At the present time, when the cattle plague is giving rise to so much alarm, the gathering and collecting together of stock (home and foreign) for the Monday market of the metropolis, for example, with the increasing and rapid development of disease that is taking place, involves matter that merits timely consideration of the Government and general public. As a matter of course the City Corporation with its markets' committee are up in a buzz as usual; but their conduct practically considered more resembles that of blue-bottle flies when the heat and stink become intolerant, than the judgment of men qualified to grapple successfully with the cattle trade of the capital. Had they got their own way, the thousands of cattle that congregate weekly from all quarters of the United Kingdom and the continent of Europe would have, to this day, been reeking and seething to suffocation in old Smithfield! and when the country compelled them to make a change, what could be expected but the construction of a cattle market long out of date before it was opened. We have Divine authority for saying that "Mankind are prone to do what they ought not to do, and to leave undone those things which they ought to do;" and the moral thus taught with so much truth-

fulness may be justly applied to the movements of the corporation of London relative to the cattle plague; for everything they have done has up to this date added to the spread of disease. Had they proposed a daily market during the "dog days," we should then have given them credit to this extent for their earnest endeavours to go-a-head in the march of improvement; but we have looked in vain for any motion in this direction.

The Egyptian Government has just traced the source of cholera to the putrid offal of the million of animals slaughtered in sacrifice during the festivals in the Mahomedan pilgrimages; but, in spite of the practical lesson thus read the British capital, relative to the concentration of putrid animal and vegetable effluvia, and to the contagious consequences that follow, what have our civic authorities done?

It would be an easy matter to prove that all the doings of the corporation of London, in reference to contagious cattle diseases, have had for their ultimate effect the concentration of disease-breeding and plague-attracting elements, so as to increase the force and effect of contagion as it were, and its rapid spread throughout town and country! It were difficult to imagine any line of conduct more wayward and adverse to duty and the requirements of the general public. One practical conclusion naturally suggests itself—viz., that a daily market would unquestionably greatly tend to lessen the predisposing cause of contagion, and also the generation and spread of steppe-murrain and all similar contagious diseases amongst cattle during the heat of summer.

Farmers are proverbially fond of a pecuniary view of things, and at the present time there is a golden difference between the producers' prices and the consumers' prices of butcher-meat that merits a searching investigation. A few butchers and cattle salesmen may well evince an anxious desire to uphold the present system, if system it can be called, and to take alarm at any proposition which threatens practically to interfere with the difference in question, such as prohibiting the importation of foreign fat stock, and the doing away with the intermediate jobbing which such would involve, well knowing that the ultimatum would be the establishment of a foreign carcase trade upon a permanent foundation. It will no doubt be said, as we have often heard once been told by several of those butchers and salesmen now taking an active and prominent part in all discussions on the subject, "That but for the middle-class jobbers, who buy in the live-stock market for the carcase trade, the producers' price would be less than what it is." Granted, of course. But this concession is not saying much for the producer's representative in the metropolitan market, and, if possible, less for those to whom he sells his live-stock consignments, whether they be top-men or middle-men; for it is only telling the simple farmer that, but for the existence of what we have shown to be a bad system, things would be worse than they are! In other words, the difference between the producer's price and consumer's price would be greater than what it is were there no middle-men purchasers for the carcase trade! The ultimatum—one which is fast working its own way onwards in the march of improvement—is to split this difference so as to put the first half into the producer's pocket, leaving the second half in that of the consumer's. And there is much more than this in favour of both producer and consumer, for at present the reduction of weight and quality of meat during live-stock marketing is incredible; so that to half the difference thus gained and saved there must be added an increase of weight to the former, and an increase of quality to the latter, which is just so much more money gained and saved by them. The butchers and live-stock salesmen of the metropolis may talk fluently of their "experience," and so forth. But what is its real value, practically speaking? "Experience" is an old hobby-horse which butchers, and not a few old-school farmers, have long ridden to death; for the carcase trade is increasing while the live-stock trade is decreasing, so that the actual experimental conclusion is too manifest to permit of being formally deduced from the facts of the case experienced on both sides. Is it not high time for practical men, such as farmers, salesmen, and butchers, to give over propping up opinionative tenets by antiquated systems that are fast falling about their ears? Doubtless the carcase trade as it exists is unsuited for the farmer, home and foreign; but that is no reason why it should be so, against either. The carcase trade we shall discuss in our next paper. Meanwhile we again

commend farmers to examine the whole subject more closely from a pecuniary point of view than is now being done. True enough the reports of the metropolitan markets that appear weekly in the *Mark Lane Express* show the live-stock sales to be higher per stone of 8lbs. than the carcase sales; but are we to understand from this that the middle-men jobbers, whose trade is fast increasing, purchase in the live-stock market to

lose money in the dead-meat market? It may be said that the golden difference lies in the offal! But is not this only jumping out of the frying-pan into the fire? In short, we must confess our inability to reconcile the facts of the case, when closely followed up from the one market to the other, with the interest of the farmer and the public.

A FIRST-PRIZE STOCK BREEDER.

## ON THE CATTLE DISEASE.—ITS ORIGIN, PREVENTION, AND CURE.

A life of upwards of sixty years' duration, in the first part of which I was trained as a merchant (in London), which profession I afterwards pursued abroad, and a twenty-five years' practice in agriculture and administrative economy in Russia, enable me to give an opinion on this important subject, which I trust may be of some use to my readers.

On my return to England in 1863, after a residence abroad of upwards of thirty-five years, I was so struck by many defects still existing in the management of sheep and cattle, that I addressed myself to the secretary of the Royal Agricultural Society of England, and proposed to communicate what experience I had gained abroad to the British public, through the *Journal* of the Society. The result was, firstly, that a communication made by me in July 1864, confirming Professor Simonds' opinion as to the necessity for, and the advantage of inoculating sheep for the small-pox, "*which had been practised under my direction in Russia for a period of upwards of twenty-five years*," was published in the *Journal* of the Royal Agricultural Society. Secondly, seeing the defective mode of treating cattle in general, and milch cows in particular, in town dairies, I anticipated imminent danger, and therefore wrote a long paper in illustration of the question, giving my views of the subject, and pointing out the urgent necessity for taking measures to bring about a more satisfactory state of things.

My paper was returned, with the remark that it was considered that my observations were not appropriate at that time, although "if your paper was reduced in bulk it would very likely be acceptable to any of our agricultural newspapers."

As it was never published, and present events prove the correctness of my views, I consider it my duty to publish its contents in a condensed form for the benefit of those amongst whom I propose to pass my last days; that will form the contents of this communication. The paper above referred to was headed,

### DISEASED CATTLE, DISEASED MILK AND MEAT.—A SURVEY AND PREVENTION.

After quoting an opinion that "the deaths of cattle from disease are most numerous in dairies," I continue: We have thus undoubted proofs that cattle disease has become an acknowledged fact as *home-bred and general*. The knowledge of the details cited induced me to visit some of the dairies in the vicinity of London, where I found a state of things truly astonishing in this enlightened age.

Not only are all the well-known rules, necessary to be observed in order to secure the interests of all parties, set at defiance, but a system is pursued which is sure to produce both *unwholesome milk and meat*.

It is needless dwelling on facts known to every experienced man, that cows require a much greater volume of fresh air to keep them in a healthy state than any other animal; and that salt is as necessary to them as it is to a human being.

We find, however, that the present rule is to keep the cows as warm as possible, without reference to the vitiated state of the atmosphere, which I have found *poisonous*, because they fatten sooner for the butcher when kept warm, and that salt is but seldom given: animals in the last stage of disease are found in the same shed with sound cows.

Lord Somerville, J. C. Curran, Esq., and others have written so much on the necessity and the advantages derived from the use of salt for animals, that one would think that it is needless to write more on that most important subject.

I have been witness that the immense supplies of tallow procured from Russia never could be produced without an abun-

dant supply of salt given to the animals when grazing. The Russian cattle-dealers, to whom I let annually some thousand acres of steppe pasture-ground, *invariably employ it*.

The immense flocks of Merino sheep pastured in Russia have their weekly supply of salt as regularly as the labourers on the farms.

I trust that the above facts will tend to confirm the many authorities which have preceded me in their judgment that it is to the interest of all cattle-dealers to ensure to their stock plenty of fresh air and a sufficient supply of salt; also to convince dairymen in particular that by doing so they will have the following advantages:

1. They will obtain more and better milk from their cows than they do by following their present system.
2. The cows will be much less subject to disease than hitherto.
3. A cow will remain in milk a longer time when supplied with salt than without it.
4. All animals will fatten at less cost when salt is given them than without it.

I consider that the following rules may be laid down as indispensable, in order to ensure the desired results:

That in all dairies situated within twenty miles of London, or any town, salt must be given to cows every other day, not less in quantity than four ounces to each: to cattle fattening three ounces daily\*.

That all sheds in which cows are kept, while having regard to a necessary degree of warmth, be properly ventilated, by having the doors and shutters, or windows, open the greater part of the day and night, *not closed as they now mostly are, thereby compelling the animals to breathe impure air*.

When many cows are kept in one shed, no boarded partitions to be allowed to form stalls. Or otherwise, when necessary to make stalls, then posts and rails to be employed alone for that purpose.

If more than fifty cows are kept in one shed, then their heads to be placed inwards, or towards the centre of the building, where on a raised platform their fodder may be given; thus ensuring great care and cleanliness, for it is always under inspection, when you visit the cows; at the same time a free current of fresh air is secured to them by opening the doors at the ends, or sides of the building.

I have found this last named plan of immense advantage in every respect.

I have no hesitation in affirming that the strict observance of these simple rules (and the usual rules of cleanliness being observed) would remedy much of the existing evils, *which I cannot but think proceed more from causes of our own creation than from contact with diseased cattle imported from abroad, or from the sister-kingdom*.

It is well known how difficult it is to overcome prejudices and confirmed opinions, and that with agriculturists in particular; therefore it may be necessary to enforce the observance of such rules as it may be advisable to make.

If it were necessary to enact that no ship shall leave Great Britain without being furnished with a proper quantity of acids to be served out to the ship's company at stated times, in order to prevent their having the scurvy, surely it is equally

\* The following is a sufficient allowance of salt to Cattle, &c. Cows and fattening cattle, as above. Every other day to young cattle 3 oz., working oxen 4 oz., three-years old 2 oz., calves 1 oz., working horses 4 oz. Sheep 2 oz. per week, given at twice in a trough. In winter it may be given daily to cattle, with chaff, &c.

important to enforce that cattle have fresh air and salt in order to ensure wholesome meat and milk, as well as the prevention of disease in the human frame, caused by poisonous provisions, *which are infallibly produced by following the unnatural system generally practised!*

JOSEPH DEACON.

Islington, 18th April, 1864.

#### PREVENTION AND CURE.

I have generally found that the same error has been committed in healing animals as with mankind: *too many drugs are given; and the efforts of nature to effect a cure, instead of being only assisted, are obstructed by the administration of drugs, which are then so many impediments to nature's action.*

This is now so well understood by enlightened professional men, that Dr. Callendar in addressing the students (as usual) previous to the commencement of this year's course of lectures at St. Bartholemew's Hospital, London, used these words "Students should learn to recognise means of cure other than those tabulated in the Pharmacopœia—fresh air, diet, &c. \*\*\* *They should never forget that nature effects, if possible, a cure.*"

The above remarks, in my opinion, apply to murrain and all diseases of that nature in particular; I therefore founded my successful mode of treating them *on the plan of only checking any evil influence, leaving to nature to do the rest!*

Every one who has studied the course of murrain agrees, that one of its most striking features, next to a state of fever, *which last bleeding does not relieve*, is the state of the stomachs of the diseased animal. Undigested and hardened food, often matter in a state of fermentation, is found in the paunch, which is distended with wind; in the third stomach sometimes hard strong lumps of food are found, sometimes a quantity of food in a high state of fermentation; the fourth stomach is often empty, sometimes contains fermented food in a state of decomposition. As in all diseases of this character, it is evident *that great acidity has prevailed, which is invariably succeeded by purging, more or less violently, according to the character the disease assumes.*

**Prevention.**—The usual rules being observed of cleanliness, proper shelter from cold and wet, *both which last are indispensable*, and strict attention paid to their having abundance of fresh air, and a regular supply of salt, as indicated in my former paper on the cattle disease, these usually suffice to preserve cattle and sheep in good health. Much, though, sometimes depends on the mode of feeding them; that branch of the subject I must leave for a future occasion.

When necessary to take other precautionary measures of preservation from disease, the plan I adopted was this: As soon as I found that inflammatory disease prevailed within the distance of about 100 miles of our place, or as soon as I observed the cattle beginning to suffer from atmospheric influences or drought, I ordered to be given to them every other day, early in the morning, diluted sulphuric acid (vitriol) and water. It was given to them by dropping the acid from a bottle into a trough filled with water, where the cattle were usually watered, stirring it all the time with a stick, and dropping the acid the whole length of the trough, in order that it might be equally distributed in the water.

It is not necessary to observe any fixed proportionate quantity of vitriol and water, for a little more or less acid is of no consequence; but the rule to be observed is, that the water is to be only *slightly acid*, so as to feel the effects on your teeth when tasting it. When administered the effect on the cattle was really often wonderful; offering convincing proof of its efficacy to the Russian peasants, who always asked for its administration when disease prevailed yet far off. From drooping, sickly animals, rejecting their food, they became lively and took well to their food again, and seemed as it were to gain new life, which carried them through a most trying period when thousands of cattle not treated in that way perished.

As long as disease prevailed in my neighbourhood the acid was given as above described. When disease did not prevail near to us (or in the total absence of disease, the weather improved) the acid was given after the first week or two only twice a week, and gradually abandoned. I found the same advantage from it in excessively dry seasons, in checking the tendency to inflammatory action in sheep.

My cattle also escaped attacks of pleuro-pneumonia, or lung

disease, while my neighbours suffered great loss of cattle from that complaint.

**Cure.**—The disease taken in its earliest stage has always yielded to the following mode of treatment. I never had occasion to try from cattle which had suffered any length of time, for during nearly twenty years I found the mode of prevention advised above, so certain, that I really had no opportunity of applying it to any great extent. I must state that the property under my administration was very great, and we were far removed from neighbours; moreover it is impossible in such a country as Russia to try any new method, unless it be under your own immediate inspection, with the remotest chance of arriving at a true result. As soon as the first symptoms of the murrain manifested itself (or even in case of dysentery) I gave a purgative, for a full grown ox or cow, of not less than three-quarters of a pint of hemp oil; after allowing an hour or two to elapse, after the animal had purged, I gave a dose of about two quarts of lime water, and shortly after a good clyster of the same. These two last were both repeated at intervals of about an hour, until the discharge from the animal began to assume a healthy appearance, free from its usual noxious smell on such occasions.

If after the lapse of a few hours the purging continued as before, not being sufficiently changed and subdued by the lime water, I then considered that the stomachs were not sufficiently evacuated of offensive matter; and gave half a pint of oil, which usually produced a copious discharge of hardened and putrid matter; after which a clyster and a draught of lime water sufficed to restore the discharge to a healthy state.

I then allowed the animal a few hours of repose, unless very feverish symptoms were present, in which case I gave every hour about a pint of water made acid with sulphuric acid, as already described. If there were not any feverish symptoms then, I gave the above named dose of acidulated water morning and evening, or allowed the animal to drink the acid water twice a day until restored to health.

After the lapse of about half a day, when the above described mode of treatment had been practised, I gave some gruel made with oatmeal, and one or two injections of the same. In a few days it was changed for barley-meal, and finally for a mash of cut hay and meal, *well scalded or steamed*, taking care that sufficient salt was mixed with all the above, *as the best tonic that can be given.*

If any tendency to purging showed itself later, the lime-water clysters only were renewed; but if that did not check it, the lime-water draught in diminished quantity was again given.

I may here remark that almost any oil may serve the purpose as a purgative; and that in very many cases which came to my knowledge and under my observation, bleeding never aided to effect a cure, but was highly injurious.

The rationale of this mode of treatment is, by a powerful dose of a medicine which is the least trying of any to a weakened stomach and system (and has the advantage of being emollient), to evacuate the stomach at once of the principal causes of continued disease; then, by means of lime-water clysters and draughts, counteract all acidity and tendency to putridity, and to strengthen, leaving the rest for nature to perform. I consider that it may be better, if the animal refused to drink the acidulated water (which acts as a tonic), and prefers, on trial, cold water, not to force the acid water on it after a few doses of it have been given.

The lime-water may be prepared as usual, or chloride of lime may be employed in the proportion of one drachm of chloride of lime in one quart of water, which may be sufficient for a draught.

The usual precautions of separating the sick cattle from the sound are of course to be strictly observed; and, in case of death, it is *indispensable that the whole carcase, skin and all, be buried in quick-time*; for it has been often proved that murrain has been spread by means of the raw hides carried into a district where not a trace of it previously existed.

All wood-work, walls, and the ground where diseased cattle have stood must be washed several times with strong lime-water, and the dung removed and burnt. Sound cattle should not be placed in such places until after the lapse of several months.

I strongly advise the use of clysters of lime-water, or even tepid pure water, in all cases of purging, for I consider their important action is too little understood or observed. In order to show the immense advantage of clysters, I may cite the au-

thority of Dr. James Irving, of the Bengal army, who was very successful in curing dysentery in the human being, as follows, *after all other means tried had failed*;

Warm water, or milk-and-water at ninety degrees of temperature was employed for an adult, from three to six pints at

a time, and reduced in quantity according to age. The mode of proceeding was, to lay the patient on his back, introduce a tube in the rectum nine inches long, and inject by means of a pump.

*Hakifar, N.S., Sept. 22, 1865.*

JOSIAH DRACON.

## THE RECENTLY-DISCOVERED PHOSPHATIC DEPOSITS IN NORTH WALES.

BY DR. VOELCKER.

[Read at the Meeting of the British Association at Birmingham.]

The discovery of new supplies of phosphatic materials, it is scarcely necessary for me to say, is of the highest importance to the English agriculturist, who, in the shape of superphosphate and similar artificial manures, consumes annually many thousand tons of phosphatic fertilizers, the demand for which is yearly increasing, not only in this country, but on the continent and in the colonies.

Under these circumstances, it is fortunate that, from time to time, fresh mineral deposits are discovered, and others are made available for manufacturing purposes, which previously were known only as objects of interest to the geologist or mineralogist.

Those engaged in the manufacture of artificial manures, or of phosphorus, are well acquainted with the fact that bones, South American boneash, Cambridgeshire and Suffolk coprolites, apatite from Canada, phosphorite from Spain, Sombbrero rock-guano, phosphatic guanos from the South Pacific Ocean, and other varieties of mineral phosphates, find a ready sale, and are largely consumed by manufacturers of manures in this country.

Apprehension has indeed been expressed that with the yearly increasing demand for phosphatic manures the supply of the raw materials could not keep pace. Such apprehensions, however, appear to me to have no foundation, for new sources of mineral phosphates are rendered practically available at the present time, which relieve us from any serious apprehension of that sort for many years to come.

The purpose of this paper, however, is not to give an account of the various kinds of phosphatic materials which are found in this country, or imported into it, but to give a brief account of a very extensive mine which has recently been discovered in North Wales. This mine contains, besides copper and iron pyrites, two phosphatic minerals, both of which are of considerable importance to the English agriculturist. One of them is a phosphatic limestone; the other a black shale, largely impregnated with phosphate of lime.

These minerals were discovered recently by Mr. Hope Jones, of Hooton, Cheshire, whilst he was searching for other minerals in the neighbourhood of a place called Cwmgyngen, about 20 miles west of Oswestry. The phosphate deposits occur not far from the clay slate and lead-bearing districts of Llangynog. The rocks are Silurian, of the Llandeilo series, and a large fault south of the vein and parallel to it brings in the Denbighshire grits. Cross faults north and south also occur, which are highly metalliferous, containing ores of copper, lead, manganese, &c. The strata (slaty shale) contains several beds of contemporaneous felspathic ash and scoria; and the usual fossils of the Llandeilo series are found, but not in great numbers.

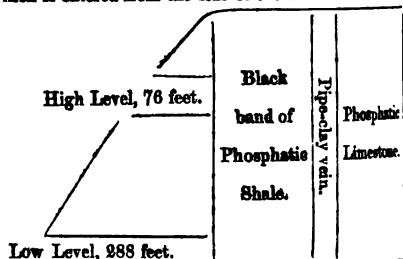
Mr. Hope Jones has traced the phosphatic beds a long distance, and informs me that they are continuous for about two miles. I have myself visited the phosphatic mine at Cwmgyngen, and on that occasion collected various specimens of limestone and black phosphatic shales, to the composition of which I shall presently refer.

The phosphatic minerals, as has already been stated, occur here in clay slate. The slate contains merely traces of phosphoric acid, has a dark colour in some places, and contains, like most clay slates, iron pyrites. The strata of the district are vertical, and the mine is naturally drainable to a depth of about 500 feet. It can be worked economically in galleries, and promises to furnish a very large quantity of phosphatic minerals. A true vein or fissure, containing vein deposit partially metallic, separates the phosphatic limestones from the

black phosphatic shale. The vein and accompanying phosphatic deposits run east and west, or, more correctly speaking, 15 degs. north of west (magnetic).

The black phosphatic slate or band is fully 18 inches thick, and the limestone bed from 8 feet 6 inches to 9 feet. The vein which separates the two deposits from each other is 14 to 16 inches wide, and filled partially with white pipe-clay, calcareous spar, and copper and iron pyrites.

The following diagram is a section of the mine at Cwmgyngen, which is entered from the side of the hill.



The deposits are readily approached by a horizontal passage which has been driven into the vertical beds of phosphatic minerals. The high level is only 76 feet long, and close to the summit of the hill. The average depth from the summit level to the drainage level is about 500 feet, and the distance here to the phosphatic deposits about 100 yards.

At present the mine is approached only by the summit level; but experience having shown that the black band widens as the depth gets lower, operations have been begun at Cwmgyngen to drive a horizontal passage into the hill at a depth of about 200 feet below the upper level, which is now being driven with as much rapidity as is possible, and will probably be completed in about three months, when a large supply of the phosphatic deposit will be obtainable.

As the depth of the mine has not yet been explored, it is impossible to give a proper estimate of its contents. But as the strata run vertically, and the black band and phosphatic shale gets wider as the depth increases, it may be safely asserted that the mine at Cwmgyngen, extending over more than a mile of ground, contains many hundred thousand, if not millions, of tons of phosphatic deposits.

Having given a description of the locality where the mine occurs, I proceed to offer some observations on the composition of the various minerals which I picked up on the occasion of my visit. I will not tire you by giving you the details of the analyses, which will be published elsewhere, and will only observe that I have made some 10 or 12 complete analyses of the various minerals, and a large number of partial analyses, which I trust will enable me to give you a good idea of the character of these phosphatic deposits.

First, we have the non-phosphatic clay slate, forming the strata of the locality. In most specimens, I found the amount of phosphoric acid too small for quantitative determination; in one specimen, however, I obtained 0.28 of phosphoric acid.

In the next place, we find a bed of black shale, 18 inches in thickness. This shale contains variable quantities of phosphoric acid. Towards the summit of the hill it is not nearly so rich in phosphate of lime as at a lower depth. Thus, a specimen No. 8, taken from a higher level, I find only 24.7 of phosphoric acid, equivalent to 46.1 per cent. of tribasic



phosphate of lime; while in another sample, taken at a lower level, I find as much as 39.67 of phosphoric acid, which is equivalent to 64.16 per cent. of phosphate of lime.

The mine at Cwmynnen, as worked at present, produces specimens containing from 54 to 66 per cent. of phosphate of lime. Blocks weighing above 1 cwt., I am informed, are now worked out, which resemble intimately the specimen in which I find 64 per cent. of phosphate of lime.

The black band contains no carbonate of lime, little magnesia, some fluoride of calcium, alumina, and oxide of iron, soluble in dilute acids, and, more or less, iron pyrites. In some specimens I find much less sulphur than in others. The highest percentage of sulphur amounts to 7.02, equivalent to about 13½ per cent. of iron pyrites. The more compact masses, found at a greater depth from the surface, contain less iron pyrites than the deposit nearer to the surface. The occurrence of graphite in this phosphatic shale is also peculiar.

Lastly, we have to take a glance at the composition of the

black limestone beds. The darker-coloured varieties contain more graphite, and are richer in phosphate of lime than the lighter-coloured specimens. In the latter I find only from 10 to 20 per cent. of phosphate of lime; in the darker varieties from 30 to 35 per cent.

The limestone beds contain a good deal of carbonate of magnesia (5 to 8 per cent.). On burning, they furnish a lime which is very valuable for agricultural purposes: for the farmer who applies this lime to his land not only supplies it with lime, a constituent required by every description of agricultural produce, but also with the still more important mineral constituent of plants—phosphoric acid. It is scarcely necessary to observe that it is chiefly the phosphoric acid in bones which renders the latter so valuable as a fertilizer; nor need I specially dwell on the fact that the application of this newly-discovered phosphate of lime is, in point of fact, almost equivalent to “liming” and “boning” in one operation.

## CULTIVATION AND MANAGEMENT OF THE FLAX PLANT.

BY PROFESSOR HODGES.

In the month of June the fields of Ulster are covered with the blue flowers of a tall and graceful plant, which attracts the attention of every stranger. Towards the end of July the blue flowers fade away, and are replaced by green balls, which gradually assume a golden colour, and glisten in the sun. The commencement of this change in the colour of the capsules of the plant is eagerly watched by the northern farmer, who knows that the time is close at hand for pulling the crop, and submitting it to the various processes which give so much occupation to the people in this part of Ireland. This valued plant of the Ulster farmers is a member of the family termed by botanists *Linacee* (the flaxworts); it is the *Linum usitatissimum* of Linnaeus, and from the earliest ages of the world has afforded a most important textile material. It would be easy to multiply references to the important place occupied by the flax plant in the earliest ages of civilization, both in the ancient seats of industrial knowledge in the East and among the primeval races of Europe. The use of its fibres for the manufacture of linen appears to have prevailed in Egypt from the most ancient times, and the interesting discovery of M. Heer, of Zurich, of the carbonized fruit of the *Linum usitatissimum* in lacustrine establishments of the age of stone, both at Waugen and at Robenhausen, affords us evidence of its early employment in Switzerland. At Waugen, pieces of cord and shreds of tissues of a material resembling flax were discovered in the ancient lake dwellings. It is, however, from Egypt that the most striking proofs, not only of the great antiquity of the culture of the plant, but of the skill which had been acquired in its manufacture, have come down to us. It is not merely that the ancient flax-growers of that country have left, in those remarkable pictorial representations which they placed on the walls of their temples and cemeteries, illustrations of every department of flax management, from the sowing of the seed to the weaving of the fibre; but in the wrappings of their dead they have preserved for our inspection specimens of that “fine linen” to which we have so many allusions in the sacred scriptures, and which, all over the East, has spread the reputation of the looms of ancient Egypt. Some years ago the body of a mummy, which had been presented by Sir James Emerson Tennent to the Museum of the Natural History Society of Belfast, was unravelled, and determined, by the examination of Dr. Hincks, well known as one of the most distinguished Egyptologists of the present day, to be that of the daughter of a courtier or personal friend of Amenemhe IV., the last sovereign but one of the 12th dynasty, who lived about 3,400 years ago. The bandages removed were found of every description of quality, from the “fine linen,” resembling our finest lawn, to a coarse fabric like sack; and as several of the pieces were darned, it was conjectured that all the old linen of the house had been employed in the work. The Egyptian flax of the present day would be unfit to produce the finer qualities; its growth is too rapid under the burning sun. With us, coarser fabrics are made of short broken flax or tow,

but the Egyptian fabrics show no trace of tow yarn. The quality and fineness of the cloth, which was examined by a linen merchant, Mr. John Muillholland, varied from 600 to 2,400. In all the pieces it was remarked that the weft was much finer than the warp, the warp being deficient in quantity to the extent of from a third to a half; and, as usual at the present day, thick threads were inserted at the end of each web to prevent their unravelling. The finer fabrics had a twilled appearance, owing to the weft rising on the surface, from the looms employed not being capable of light weaving. Thus, on the body of a lady who died 500 years before the birth of Homer, who lived, as Sir Emerson Tennent remarked on the occasion of unrolling her remains, when Cæcrops founded Athens, and before the fall of Nineveh, and who may have stood in the presence of the great Hebrew lawgiver, were found, in every variety of texture, fabrics resembling those in the production of which the spinners of Belfast now occupy the place of the ancient inhabitants of the valley of the Nile. The splendid linen trophy which the merchants of Ulster raised in the hall of the late London Exhibition proved that in this western land a people unknown to the nation over which Amenemhe IV. ruled have succeeded in giving to the produce of the flax a perfection which it probably had never attained in the early home of its manufacture.

The remarkable development of the linen trade of the north of Ireland within the last half-dozen years has probably at the present, more than any previous time, directed attention in all parts of the United Kingdom to the subject of flax cultivation. The value of the flax crop to the Irish farmer, and the influence which the extension of the linen manufacture have exerted on the prosperity of Ulster, are strongly illustrated in the history of the once insignificant town of Belfast, which has become the linen metropolis of Ireland, with a busy population of 140,000 inhabitants. Forty years ago this town did not possess a single spinning-mill. Of the 700,000 spindles now at work in Ireland, more than three-fourths belong to Belfast and its immediate neighbourhood, and of the 35,000 persons employed, a like population is located in Belfast. In almost every street of the town palace-like warehouses are springing up in the place of the old dingy offices; and though in July, 1863, the assistance of 8,500 power-looms had been added to the productive powers of the factories, yet so great was the increased demand caused by the dearth of raw cotton, that our spinners were unable to meet the requirements of their customers. Though there was last year an enormous increase on the home supply of flax, yet the iron fingers of our mills consume far more than the fields of the United Kingdom have yet produced. The area devoted to the cultivation of the plant in 1864 amounted to 301,942 acres; while in 1809 only 35,060 acres were produced in Ireland. Last year, from the want of adequate preparation and unskilful management, many farmers were disappointed in their expected profits; and, in the present year, in some remote districts where there are no

scutching mills, and the people do not possess that knowledge of the crop which exists in Ulster, it is probable that a smaller amount of the crop will be grown. It is to be regretted that there should be any decrease in the home supply; for it is not merely in Ireland that the demand for raw material is likely to increase. The instructive reports of Mr. Alexander Redgrave and Mr. Robert Baker, inspectors of factories, for the half-year ending 31st October, 1864, which have just been published, show us that the following continental countries have added largely to their spinning power.

LIST OF SPINNING MILLS, WITH AN APPROXIMATION OF THE NUMBER OF SPINDLES, IN THE FOLLOWING COUNTRIES.

Country.	No. of Mills.	Spindles at Work.	Spindles ordered.	Spindles projected.	Number of Spindles 10 years ago.
Bohemia .....	34	137,900	72,700	4,000	33,000
Moravia .....	21	47,300	58,416	3,800	20,000
Prussia .....	22	133,800	38,200	8,300	47,000
Saxony .....	5	15,000	9,200	6,000	4,000
Austria .....	1	7,000	3,000	...	...
Hanover .....	3	8,000	...	...	...
Bavaria .....	4	10,000	...	...	2,000
Poland .....	1	4,000	...	6,000	...
Switzerland ...	3	5,000	...	...	3,500
Total .....	94	368,200	181,516	28,100	109,500

Thus, when the spindles ordered and those projected to be added are at work, flax spinning in the above countries will have increased in ten years 426 per cent. In France, Belgium, and Russia also a rapid increase in the number of spindles has taken place. In 1864 France had 563,000 spindles, and by the end of 1865 it is expected that this number will be increased to 680,000. Even with the enormous increase in the production of flax in Ireland last year, the produce of 301,942 acres, estimated at 75,485 tons, is far below the amount required by the spinners of the United Kingdom, who were obliged to import 91,406 tons from foreign countries, are thus forced to depend for the raw material upon countries which are likely, in the course of a few years, to dispute with us for the position which we at present enjoy as the chief linen manufacturers in the world. We are of opinion that Ireland possesses in her soil and climate advantages for the production of flax which, if her fields were judiciously cultivated, would enable her to produce more fibre than would be required to meet the wants of Europe. The mild, moist climate of the island is most favourable for that slow and regular growth of the plant which is essential to produce soft, yet strong, pliable, and easily divisible filaments; and its soils are in general easily reduced to that fine state of division which is necessary to enable the plant readily to obtain the materials required for its perfect development. It has at all times been necessary for our spinners to send to Belgium and France for the delicate fibres required to spin certain numbers. Hitherto, even in Ulster, our farmers have not given that attention to the management of the crop in all its stages which has long been devoted to it in some continental countries; yet we believe, judging from the samples of Irish fabric occasionally produced, that our farmers by judicious management might produce finer qualities of fibre, and thus secure more remunerative prices. It is an old saying, that "flax is either the best or the worst crop that a farmer could grow." The want of success, we consider, depends more frequently on the ignorance or carelessness of the cultivator than on the soil. We have seen attempts to grow flax upon fields which were rendered incapable of yielding profitable returns of any kind of crop. Still, as in the days of the poet Tusser, it may be complained that—

"Crop upon crop many farmers do take  
And reap little profit, for greediness sake."

The treatment of the soil in many parts of Ireland excites the astonishment of those familiar with the efforts made in districts where agriculture is more advanced to maintain its fertilizing qualities. "Were," says the author of a sensible little work on flax, "human ingenuity employed upon framing a scheme which should have the power of converting the best

land into the worst condition, at the shortest possible notice, we can readily conceive that it must have a strong family likeness to the plan generally adopted in Ireland."

In both England and Scotland the cultivation of flax as a fibre crop has not at any time extended beyond a limited area. The idea that it exerted some peculiarly "scouring effect upon the soil" has at all times rendered farmers indisposed to introduce it among their regular crops. With respect to the exhausting effects of the culture of flax, chemistry teaches us that, like every crop grown by the farmer, flax takes from the soil certain constituents upon the presence of which its fertility depends. But it also teaches us that the amount of those materials which are necessarily removed from the farm is very small—indeed, much less than is removed by most of the crops grown on our farms; and that, provided we save the highly nutritious seed capsules, and consume them in feeding our cattle, and utilize the woody fibres of the stem, removed in scutching, as fuel, and restore the ashes to the soil, the quantity of inorganic matter carried off the farm in the flax sold to the spinners is but trifling, and may be replaced in artificial manure at the cost of two or three shillings per acre. Properly managed, we believe that flax may be made one of the least exhausting of all crops grown by our farmers. The ignorance respecting the value of the fibre of the flax plant, which even at the present day prevails in some parts of England, is most remarkable, and was amusingly illustrated some years ago by the remark of an English farmer, who every year cultivated the plant solely for the sake of the valuable feeding which its seed afforded, that "he was puzzled what to do with the straw, as it was most troublesome—it would not even rot properly in the manure heap." In some parts of England the only use made of the straw is to employ it for thatch. The Irish farmer destroys the nutritious seed in the steep-hole, as he seldom removes them before steeping, but prizes the straw; while the English flax-grower, in many districts, sows the crop solely for its seeds, and despises the more valuable fibre.

The sowing of the flax-seed should, if the weather permit, be completed before the beginning of May, though in some districts it is delayed beyond that period. In Ulster it is considered advisable to sow not later than the 15th of April; the usual allowance of seed being at the rate of 2½ to 3 bushels to the statute acre. The seed selected by our farmers is either the produce of Livonia or Esthonia, brought from Riga, or Dutch seed, which is preferred to Russian when the soil is strong and heavy. Great care should be taken in the selection of sound seed. Black seed, or that which has been kiln-dried, should be rejected. Sound seeds have a brilliant golden or clear-brown colour. The vegetative power of the seed is frequently tested on the Continent by sowing a certain number of the seeds in the month of February, when there is but little activity of vegetation, and the seed is considered a fair sample if one-half of the number sown produces plants. In the commercial cities of the Baltic the method adopted to ascertain the quality of the seed is to place over the fire a metal plate until it is almost red hot, and then to allow the seeds to fall one by one upon it. The sound seeds spring away with a report, while those seeds in which the oily parts have dried up, and which have become incapable of vegetation, remain on the plate and are burned. The sowing is invariably performed by hand broadcast. The seed should be covered with only a light coat of earth; and a light seed harrow, followed by rolling, will complete the work.

The flax plant is found, as might be expected, from the history of its extensive cultivation both in eastern and northern countries, to thrive upon soils of very diverse qualities, and in regions varying very much in temperature. Yet it is only in situations in which the proper climatic conditions exist, and on soils of special qualities, that its textile fibres develop themselves in perfection, or exhibit that combination of softness, strength, and fineness which renders the flax of certain countries so much esteemed. In European countries littoral regions constitute the favourite localities for its cultivation; and the plains of Belgium and Holland, the Baltic provinces of Russia, the coasts of the Mediterranean, and the maritime provinces of France are the districts from which our chief supplies of fibre are derived.

A friable, loamy soil rests on a well-drained clay bottom free from stagnant water, should, if possible, be selected for the cultivation of the plant. On lands reclaimed from river and

may also be grown with advantage. Thus on the slob reclaimed from the river Foyle, in the county of Londonderry, which gave a soil that we found to possess the following composition, superior crops have been raised:—

## COMPOSITION OF SLOB LAND FROM LOUGH FOYLE.

## I.—BY WASHING.

Clay and organic matters ... ..	10.97	Denomination, Sandy garden loam.
Sand ... ..	89.03	

100.00

## II.—BY ANALYSIS.

Potash ... ..	0.11	0.94 soluble in water.
Soda ... ..	0.03	
Lime ... ..	0.09	
Chlorine ... ..	0.17	
Sulphuric acid ... ..	0.06	
Organic matter ... ..	0.48	
Oxide of iron ... ..	7.49	20.10 soluble in acid.
Alumina... ..	3.31	
Lime ... ..	1.12	
Magnesia... ..	0.09	
Carbonic acid ... ..	0.65	
Phosphoric acid ... ..	0.02	
Silica ... ..	0.28	7.14
Organic matter ... ..	7.14	
Insoluble silicious matter ... ..	79.01	

100.05

Nitrogen per cent. 0.19, equal to 0.23 ammonia.

Water in the sample, 11.38 per cent.

If the bed for the seeds has been rendered fine and level, and they have been deposited at a uniform depth, the plants may be expected to appear above ground in ten or twelve days. Under the influence of the showers of April they will rapidly put forth their leaves. When they have attained the height of three or four inches the farmer should carefully remove every weed that springs up to rob the plants of their fair proportion of the elements of the soil. A breezy day should be selected for weeding. In Belgium bands of women with bare feet, or list slippers, advance over the fields on all-fours, placing a cloth under their knees, and proceeding in a direction opposite to the wind, so that the soft and tiny plants pressed down in their course are elevated by the current of air, and enabled to attain an upright position. The loosened soil brings fresh supplies of food into contact with the absorbing rootlets, and the work of development goes regularly on. At this early stage of growth

the plants are not easily injured. We have made some analyses which show that each plant at this stage consists of—

Water ... ..	87.63
Organic matter ... ..	10.64
Mineral matters ... ..	1.73

100.00

If the weeding be delayed until the stems become more rigid, from the increased amount of solid matter formed, much injury will be done to the regular growth of the fibre. Usually when the seed has been sown early in April, the crop will be ready for removal from the field about the end of July. The Belgian farmers, to obtain the fibre of superior fineness, recommend that the removal should commence "between the falling of the flower and the formation of the seed, so that unless it is wished to sacrifice the quality of the flax to obtain seed, the former must not await the full maturity of the latter." In this country, however, it is considered that it is more profitable, and more likely to ensure a strong and fine fibre, to allow the plants to remain until the leaves have fallen from the lower part of the stem, and its colour for two-thirds of its length has acquired a yellow tinge. The flax is removed by pulling up the stems, which is all done by hand, the work in Ulster being chiefly performed by women. We think that some more expeditious method will yet be applied. We have heard that some years ago our inventive friends, the Americans, had hit upon and patented the plan of a pulling machine, which, with one horse, could pull and spread six acres in a day.

When there is a second growth of short stems, it is usual for the pullers to take hold of the long stems, just below the seed vessels, so as to leave the short stems for a second operation. The handfuls of pulled straw, as they are removed from the soil, are laid diagonally across each other, to be ready for the removal of the bolls or "ripping," which should be performed in the field at the same time as the pulling is going forward.

The farmers of England and Scotland, who have learned to appreciate the highly nutritive qualities of the flax seed, will be surprised to find some of the growers of the crops in Ireland even at the present day contending that if the seed vessels be removed the flax will not "water" properly, or give fibre of a good quality; and in many of the best flax districts this notion every year leads to the destruction in the steep-holes of valuable food, which, preserved for feeding cattle, would add enormously to the profit of the farmer, and at the same time preserve the fertility of the soil. We have, in autumn, seen mounds of the valuable bolls decaying on the coasts of Down and Antrim, to which they have been carried by the streams from the flax pools.—*Practical Mechanics' Journal*.

## EXPERIMENTS ON MARL.

With respect to ameliorating chalks, geology and chemistry have rendered great services to agriculture—the first by pointing out their repository, importance, &c.: the second particularly by determining their composition, and the conditions of the soils which require their use. In these respects, in fact, the application of chemistry is most sure. In many localities the instructions of these two sciences are received well; but in a far greater number they are rejected, either through ignorance of the advantages that will accrue from the light they throw on the subject, or through carelessness, which results from false ideas created by incomplete experience, and very often the presumption that enough is already known. Nevertheless, the power of calcareous agents as a means of fertilization is a fact well established in practical agriculture; and the matters which compose them abound almost everywhere. Still, by the intervention of men devoted to progress or careful of their own interests, marling is becoming more and more practised every day; and we may reasonably predict, from that fact, a very considerable increase in the production of certain soils, of great importance from their extent. But in Dordogne (my country), where the uplands are generally flinty clay or ferruginous, consequently covered with heather, and where the valleys—clayey flint—are very acid, generally

wanting in carbonate of lime, the farmers remain obstinately indifferent. They ought to know, however, that Limousin, which joins us, derives immense advantage from it, and that many of the provinces owe their richness to it.

*Marl*.—Marl is composed, in different proportions, of the same elements that constitute the earth—that is to say, of clay, carbonate of lime, flint in a sandy state, or silicates combined with alumina or lime. A good deal of it contains organic remains decomposed, and oxides, which colour it variously. But the aspect of this matter everywhere is considerably changed by the different proportions of clay, carbonate of lime, &c.; so that you scarcely find two marls alike anywhere.

Does marl, then, constitute in itself a primitive formation, independent of others of a mineral nature, as is commonly supposed, and as we should be led to believe from certain authors? Assuredly not; and it is important that we gain correct ideas in that respect, for many agriculturists neglect furnishing their fields with carbonate of lime, which is deficient, because they see no other means than employing lime properly so called, which is too dear, or marl such as they imagine it to be, and therefore believe themselves to be deprived of.

In most of the conditions of soils reclaimed by the use of marl, the efficacy of the improvement is almost exclusively due to the carbonate of lime. Consequently all matters, such as stones, marbles, clays, &c., which contain that calcareous salt in a divided state, and capable of combining itself with the earth, are suitable for marling. Thus what is vulgarly called "death-stone," all the stones which stratify themselves easily, and chalk are very advantageous for marling. We even read, in a treatise on agricultural geology, "Chalk is the richest of marls; for it is formed of calcareous matter almost in a pure state, or only mixed with a small proportion of sand." I obtain the marl I use from the side of considerable masses of calcareous clays, or in the "crevasses" that they present. In certain parts, where it is sticky and grey, it manifestly contains organic detritus, and possesses, from that alone, vast fertilizing powers; in others it is pulverulent, particularly in the neighbourhood of the nodules of ferruginous silica, where it is clearly sprinkled. We also find there very irregular fragments of silicate of lime, remarkable for their lightness.

This marly matter mixing itself without any very sensible transition with the calcareous mass, and the latter gaining greater density according as it is removed from it, we may infer that the two are identical in nature, and that the want of cohesion in the first is attributable to the presence of another mineral—possibly manganese—for we notice in it discolorations of a fine rose tint. Being, as I have been for a long time, under the intimate persuasion that marl is, at least here, merely clayey lime broken up, I often use the latter in its solid state, and cannot perceive the least difference in its effect, except in cases where the soil is very stony, and requires clay as much as lime. I estimate, besides, that when the amending agent has to be transported from a very great distance, there is economy in the cargo containing a large quantity of the active principle; indeed, the matter cannot be spread until some months after, when it has become disintegrated.

There is a difference in opinion amongst geologists about marl. Some class it with the secondary earths, others among the tertiary beds of the terrestrial globe. The fact is, it is found in both. That from secondary earths contains, in many places, a great quantity of shells; but I have as yet only found amongst the marl I use some small ammonites, and they manifestly come from fresh water. Therefore the geological part of my work, the most difficult to me, is not the most interesting.

*The Principal Modes of Action in Marl.*—It is abundantly proved that every soil suitably provided with humus should, in order to be thoroughly fertile, possess in its constitution at least a small proportion of carbonate of lime, as the want of it renders the culture of most useful plants exceedingly unsatisfactory, even though the greatest care be taken in the cultivation of them. But when we give to a soil deprived of it that element, so essential to its normal composition, we rapidly double and even treble its production, because, on the one hand, healthy plants assimilate and nourish themselves in the proportions necessary to their perfect development, and, on the other hand, lands where lime is wanting saturate themselves with acids only suitable to useless plants, such as red sorrel, the small rush, bent-grass, couch-grass, brake, moss, &c. From that cause, the clearings of waste lands, impregnated as they are with tannic acid, never become fertile, in spite of the large quantity of humus they contain, unless they have been dressed with animal charcoal from lime or marl. It is the same with all vegetable earth containing oxalic and other acids injurious to the assimilable properties of economic plants. In such cases the calcareous acids not only neutralize the acids which stop the vegetative movements of plants reserved by Providence for the use of man, but, by acting chemically upon the decayed organic matter contained in it, they considerably facilitate the dissolution of it in the water, which afterwards serves them as a vehicle, and presents them to the absorption of the roots. Lands too stony fail, from the cohesion necessary to resist the disintegrating action of the water, and do not retain sufficient humidity. Now, supposing that these soils possessed lime primitively, it must have been carried by the rains to depths inaccessible to the roots of plants: therefore, nothing can so effectually remove this serious defect as marl mixed with clay.

Compact, plastic clays often contain a sufficient proportion of carbonate of lime, as may be seen by the presence of bits of white stones easily crumbled, and also by the white crust

which covers the fragments of flint found there. In these lands marl can be but of little use in diminishing the plasticity and hygrometrical conditions unfavourable to all good culture. But the cold clays without traces of carbonate of lime, and those which receive the waters of forests always acid, on the contrary gain infinitely from being copiously marled.

Is it therefore advantageous to marl a soil charged with ferruginous oxides, even when it is not deprived of the calcareous element? I do not hesitate to reply in the affirmative. In my experiments with marl I have always found the soil become sensibly more fertile, and even more easy to work; and one remarkable effect is that vegetable earth takes under the influence of the calcareous agent a very dark tint, as though the oxide of iron which coloured it had descended to the first degree of oxydation.

But calcareous agents for the use of agriculture are not limited in power to the very important modifications which they produce in the actual constitution of the soil, neither do they confine themselves merely to purging it of the acidity so detrimental to its natural fertility. Carbonate of lime evidently supplies nutrition to the plants; for chemical analysis has proved that the quantities relatively are considerable in the grains and straw of some cereals, particularly lucerne, sainfoin, clover, peas, colza, &c.

The vegetation in plants which have accidentally sprung up upon a heap of marl is sometimes prodigiously active. Thus, two stalks of hemp, placed under these conditions, grew the one to the height of 4 metres, the other to 3.72 metres: a single grain of wheat ripened with sixteen stems, each carrying an ear well filled. Some children had pulled it up when I should have cut it, so that I was not able to count the grains. The same thing occurred with a turnip, which appeared to have attained an enormous bulk. This marl seemed completely deprived of humus; but, as it came from a cave that had been dug very deep, it is possible that it contained some nitrous salts. I will now state some facts which justify me in the opinion that clayey lime may to a certain point suffer to the alimentation of some plants. 1st. The field from which I get my marl is sown with sainfoin. The vegetable bed is not more than six or seven centimetres deep; but the roots descend into the calcareous mass to the depth of two metres, and the vegetation of that sainfoin is exceedingly fine. 2nd. I have separated some stalks of the same plant from the vegetable earth; and, although thus through the destruction of the coronal roots they could not draw out the nourishment that the calcareous matter contains, they grew as fast as the others. The same results were obtained from experiments upon coltsfoot and briars. 3rd. I reduced some very clayey lime to a pasty powder; in appearance, at least, pure. I then put it into a small enclosure, and last November sowed there, all at the same time, some wheat, rye, and vetches. The rye perished; but the wheat and vetches resisted the cold of winter and flourished well. 4th. I spread over some sainfoin and lucerne some calcareous clay reduced to a powder. Some days after an ordinary rain the plants began to grow rapidly, and are now nearly three centimetres higher than those which were not so treated; but it is possible that the property which M. Payen attributes to lime of stimulating the assimilation of plants may have something to do with this phenomenon. Upon very chalky soils sown with lucerne and sainfoin, I have frequently made a covering of marl containing 80 per cent. carbonate of lime, and with marked advantage.

*Method of using Marl.*—Having determined the state of a soil which indicates the use of marl, I shall proceed to show the principal rules of it; but I must speak specially from my own experience. When we have a large extent of land entirely or very nearly deprived of carbonate of lime, we cannot employ the time we have at our disposal better than in transporting that precious manure to the soil. It is not well to trouble ourselves too much about the season, only we must not expect to derive advantage from it afterwards, when we might have foreseen the drought. In fact every time I have sown or spread marl over grass-land under these conditions, it has done harm. Some wheat sown at the end of November lay in a field well prepared but strongly marled, has been literally burnt. I wished to make it a specimen of the efficacy of lime.

It is customary to put marl in small heaps on the land, and leave it there for some time, in order that it may be submitted to the action of atmospheric gases. Now, I proceed in a different manner. If the marl is powdered, I spread it as soon

as possible, in order that it may be well mixed with the soil by continued labours; but, if it is in calcareous fragments, I do not leave it longer in heaps than is absolutely necessary, for this reason—piled up, it only disintegrates itself at the surface, and, even after a sharp winter, marling can be effected but very imperfectly when the fragments are buried in the same state as when they were placed on the soil, and only become decomposed in proportion as they return to it. Besides, how can lime be deprived of the action of atmospheric agents by being dispersed? Is it not advantageous to the impregnation of the soil through it in case of rains, and is it not an additional means of drawing the greatest part of its faculty of decomposing the matters which resist the dissolvent action of the waters without its aid?

With regard to the quantity of marl there can be no precise rule; it is only after repeated trials that the most efficient dose can be determined.

Besides, when there is a great extent of land to be reclaimed by the use of it, it is more profitable to marl the whole, than limited portions abundantly, except to renew the operation as quickly as possible. In fact, experience alone teaches whether it suffices to give much or little carbonate of lime to soils wanting in it, in order to at least double the production. Except in cases of cleared waste lands, I marl in the average proportion of 40 cubic metres to the hectare; but my marl is so rich in active principles that, placed under the litter of bullocks, it burns their hair, and will strongly affect the skin of the hands if touched often. When the proportions of clay are greater, the dose of marl must be increased accordingly, so that even 300 metres may be required; or, when the soil is very flinty, and if the marl only contains 90 per cent. carbonate of lime, in which case the best manure will be only clay marl.

With acid lands, it is a good plan to use marl as a covering to cereals, particularly when the rains are sufficiently heavy to penetrate through the soil. On the contrary, no immediate advantage can be derived when the weather remains dry; indeed no marling will succeed well under these conditions.

Marl brought into the meadows by overflowing is only useful so far as it is alone distributed there in minute proportions; but, if ever so little vegetable mould or manure be added, the water marks, upon its passage, traces of a vigorous vegetation; whilst without that addition, I scarcely know why, it favours the development of moss.

*Lime and marl compared in an agricultural point of view.*—No doubt lime should prevail when it is required to correct acidity in a soil, and decompose the organic matters which resist the dissolvent action of ordinary water; but, except in these two cases, marl, in a sufficiently divided state, and containing at least 50 per cent. carbonate of lime, is generally preferable. In the first place, lime can scarcely be supplied to the cultivator for less than 3 fr. the two hectolitres, which makes liming very expensive; and the effects of that operation, soon apparent it is true, are often not of many years' duration. Then, it is not our object here to show the important difference between lime which has been subjected by free air to hydration and recarbonisation, and the natural calcareous marls. Even if it were so, there would still be an advantage in using the latter for clay, silicea, &c.; as much of their cultural utility is comprised in being modifiers of the soil. In fact, notwithstanding the great advantages derived in agriculture from the use of lime, it never enters the head of intelligent practitioners to have recourse to it, when a rich calcareous marl is carried to them—that would be too much against their interests! Besides, marly products are evidently better suited to a sandy soil and the powerful consideration of the price of returns, and very quickly determines the difficulty of choice.

*The products of marl and manure.*—Many persons have been struck with the results of my marling, and have said to me: "Then it is evident that marl can fill the place of manure"; to which I reply that marl is an excellent means of increasing vegetable productiveness, and when used upon acid soils, full of decayed organic matter, like cleaned waste lands or marshy meadows, it often has even a more advantageous effect than ordinary manure; but it would not be the same under other conditions: the marl would then only be an auxiliary to the manure, singularly accelerating the assimilation of plants, by virtue of stimulating properties. Some possess the double faculty of assisting the decomposition of organic matter and exciting the activity of vegetable absorption. Upon this subject I must not omit to mention a fact, well worthy of attention,

that very cretaceous lands containing a large proportion of carbonate of lime, such as that existing to a considerable extent in Champagne, and many countries of the Perigord, if cultivated without sufficient manure, produce scarcely anything; but if, on the contrary, abundance of manure is supplied to them, they yield prodigious crops. That, then, is the source of the modern prosperity of Champagne, formerly, with reason, called *lousy*. Unfortunately, lime in that case expends too much humus, so that, in order to leave the soil in a thoroughly productive state, it is necessary to manure incessantly, and that is not always possible. Thus, we see lands near us, formerly sown with fine wheats, now abandoned as unproductive; whilst, in other countries, chalk soils have been rendered suitable for every culture through the effects of copious and repeated manuring, and by successive deep culture of the vegetable bed.

With a view to strengthening the fertilizing properties of stable dung, some one conceived the idea of adding lime to it; and it appears that even now this practice is maintained as advantageous in certain Departments. I have tried it with marl, and found it succeeded extremely well. I proceeded to raise the litter every two days, taking away the dung and urine to stratify with the calcareous matter in beds of nearly equal thickness. The cleansing of fifteen days is thus employed in making a heap of manure, which is left for the same time to ferment. If before removing it a thermometer is placed in the centre of the heap, it will soon be seen to rise to 95 degrees (F.), or even more, though the mass be not smoking, and exhaled scarcely any odour. This is attributed (I think reasonably) to the action of the carbonic acid from the lime on the gases which are formed during the putrid fermentation, which action results in fixed saline combinations, thereby considerably enriching the manure; whilst without the intervention of the carbonate of lime these fertilizing gaseous principles would for the major part escape.

The same theory teaches us that the mixture of calcareous matters with spent manure has the effect of altering the quality of the latter by volatilizing principles which were fixed before; but it may be remarked that it is more convenient to make this mixture at the time of spreading.

This method of mixing ordinary manure should be adopted, especially where heath is used as litter. In the formation of manures, heath is really only useful as the excipient of excrements. Ligneous and tannic as it is, it is suitable to none but compact clay soils, more or less calcareous, to excite them, and to those which are saturated with lime, like the cretaceous soils. In order to make heath useful in any other kind of soil, it is necessary to correct these defects by means of lime. Having put a thick bed of heather in the middle of a flinty clay soil, in order to facilitate cartage, we have, for the last four years, had crops less than half equal to our neighbours. If this observation is not unique, it completely confirms what I state. In every case, it should lead people to seek a better material for litter.

In conclusion, I would say that it is vexing to see such efficacious and economical means of improving soils, as marl represents, neglected as it is: indeed, the indifference shown to it cannot be justified when it is well known that many Departments derive their prosperity from the use of marl, and that wherever it has been tried the most satisfactory results have been obtained.

But the favourable results from the use of amending limes are not exclusively material. Under the influence of the freedom they give, the manners of cultivators improve, their personal dignity increases, and, as the statistics of crime show, man is less inclined to follow evil instincts, and observes the rules of honesty more strictly. These reasons are wanting neither in depth nor value; nevertheless, in the actual disposition of minds in certain places, they meet with only a disdainful reception, as though they took their source in fallacious experiments. But, in spite of prevention and carelessness, however deplorable both may be, progress will triumph over these obstacles; and those who reject it will bitterly regret having lost so much precious time, and not having sooner realized the good they might so have obtained.

VEYSSIERE,

President of the Agricultural Committee of Vergt.

—*Journal d'Agriculture Pratique.*

## LORD LEICESTER ON AGRICULTURAL AFFAIRS.

At the annual meeting of the Docking Agricultural Association, which was held at Docking last week,

The Earl of LEICESTER said: I am afraid that I cannot congratulate you upon meeting under propitious circumstances. We have harvested the very worst wheat crop that I ever recollect in this district (Hear, hear), the natural result of having had no flag, no plough in, an unpropitious seed time, and early and severe frosts in the spring. I am afraid our prospects for the future wheat crop are not very bright. It is very desirable that in this district of the county we should get our wheats in early. It is now the 6th of October, and there is very little land prepared for the wheat crop. Our barleys on our light lands were burnt up, and on all lands they were badly got up. Yet as the barley harvest was tolerably general throughout the country during a period of wet weather, I think that our Norfolk barleys are likely to hold their own, and those who hold such samples as were contemptuously discarded last year are likely to meet, I trust, with a fair price. While our barleys were being drenched we were rejoicing in the hopes of an abundant root-crop. The extraordinary drought of the last five weeks has destroyed that prospect. Our mangolds are good, but turnips must be deficient in quantity if not in quality. I am more and more satisfied of the beneficial results pertaining to deep cultivation for the root crop (Hear, hear), and I am satisfied that one deep ploughing, and only one ploughing in the early winter, is the best means of retaining the moisture in the land, without which the turnip crop must be a failure. It is true that beef and mutton are fetching extraordinary prices, but we have to give nearly butchers' prices for our store stock. Our light land arable farms in West Norfolk are not adapted for the breeding of either cattle or sheep; therefore we do not derive that advantage from the high price of meat which we otherwise should do. And now, gentlemen, we are threatened with a disease in our cattle and our sheep; but I think that, from the exertions of the committee of our association, and especially through the exertions of Mr. Read—to whom we are deeply indebted (cheers) for the prompt and vigorous measures which were taken to prevent diseased cattle from infecting the healthy—with proper caution on our part and with a prospect of cooler weather, I trust we may escape severe losses from this calamity. This is a long list of grievances, but I think that we have learnt something from our trials that will be of service to us even in years of abundance. Continued prosperity causes the energies of man to lie dormant, and in the trials and difficulties we have had lately to contend with we have learnt some things. We have learnt that hay—the most costly crop we can grow—is not a necessary item in our produce. We have learnt the value of straw as a feeding article. We have learnt how to economize our root crop. And if we have learnt that it is desirable to give deep cultivation to the roots of our plants to enable them to seek moisture in the earth, the trials that have been given us have not been, I trust, in vain. But we have not met here solely for the purpose of talking over our own affairs, but to consider what progress we have made in improving the condition of the labourer. Although we may not be altogether prosperous at the present time, I think that I may say that he is. Labour is abundant, wages are high, and bread is cheap, and I think we may rejoice upon the moral and physical improvement of our labourer. Drunkenness used to be a common vice in this district. It was no uncommon thing to see a man intoxicated. But I think I can say that for some years I have not seen one of my labourers the worse for drink. It was impossible at one time to get any work done without an allowance of beer; it was beer here, beer there, and beer everywhere. Now I never make any allowance of beer to any of my labourers; I give a full equivalent in money; they prefer it, and I am quite sure that they, their wives, and their families are the gainers by it. I am satisfied, also, gentlemen, that there is no work but what can be done better without the beer than the men are in the habit of getting than with it. Many of my men

are teetotallers. I do not think that it is desirable that men who can abstain from drinking malt or spirituous liquors to excess should bind themselves by a pledge, but those who find they cannot control themselves and abstain from excess have done a wise thing in doing so. They cannot obtain the beer that we drink, they cannot obtain the light wines of Germany and France, which will quench our thirst without causing intoxication. If they drink, they must drink the drugged beer of the publican, which tends to excite their thirst and to cause excess; or they must drink the wretched stuff which is made at home, which is quite sufficient in itself to make any man a teetotaller. If the malt duty was repealed, the poor man's wife can never brew beer, and the money that is spent in the attempt had far better be employed in the providing other luxuries or comforts for her husband's home. I must now congratulate this union as being the only union in this country which has adopted that wise measure of a union settlement, and for having given a precedent to Parliament for passing an act which will do more to benefit the labourer than any other measure that has been hitherto attempted on his behalf. Up to the present time our duties and interests have been apparently antagonistic. I say, apparently, gentlemen, because we had begun to learn that, unless we provided proper cottage accommodation for our labourers within a reasonable distance of their work, we were likely to lose the service of our best labourers. We also consider that it was better to open our close parishes, and be subject to provide for the aged and infirm, rather than to depend upon the supply of our labourers from the distant and open parishes. That the evils which existed under the old law can be immediately remedied is impossible. Before the Act that was called the New Poor Law was passed, there were certain parishes in this estate that paid 19s. in the pound poor-rates. Certainly at that time, if it was not the duty, it was the policy and interest of the owners of the property to endeavour to diminish the population, and not to increase the cottage accommodation. But railways and other causes have entirely altered the position of employers and employed. And after all that can be done or has been done by Parliament, or by societies like this, the physical and moral improvement of the labourer must mainly depend upon his landlord and upon his employer. While I am upon the subject of rates I will allude to what I consider to be an injustice in the existing law. There has been lately a very wise and proper readjustment of the rates of our respective parishes, but there are certain descriptions of property that I think are unwisely exempted from being rated. I see no reason why the 2,000 acres of wood that I hold in this county—retaining them as I do for the purposes of game or ornament—all of which, if converted into pasture or arables, would be subject to rates, should not pay their quota to the poor-rates. This law was established years ago for the purpose of encouraging owners of property to plant timber for the purposes of the Royal navy, and when the reasons for that encouragement ceased the exemptions which were derived from it should have ceased also. I do not think that it would be right to value the woodland property at the rate as the lands adjoining. That land has been brought up to its present state of value by skill and capital. The land that is under wood should be valued according to its natural value if converted into land for agricultural purposes. It has been argued that it would be by no means desirable to alter a law so as to encourage the destruction of our wooded districts. The love of sport and the desirable appreciation of ornament that exists in all Englishmen's breasts is such that in my opinion there would be no danger of any material decrease of the woodland districts of this county. The difference that would be made in the rate would be comparatively inappreciable; but it would remove an act of injustice, and it would prevent that feeling of discontent which I can quite understand exists in the breasts of many of those who are not the owners of this description of property.

## AGRICULTURAL COMMERCE IN THE LAKE DISTRICTS OF AMERICA.

It is curious and instructive to mark the progress of American cities in the lake districts, which are centres of agricultural commerce. We have been apt to look with surprise upon the progress of Chicago; but we have just received the trade reports of another rising town of the west, which is fast treading upon the heels of Chicago, and that is Toledo, in Ohio. As Chicago is the grain dépôt and shipping port for Wisconsin, Illinois, and the other districts bordering on Lake Michigan, so is Toledo for Michigan, Indiana, Kentucky, and Ohio. Twenty years ago Toledo was but a village, with 1,000 inhabitants: now it boasts of a population of 20,000; and the rapidity with which it is growing, even at the present time, has hardly been exceeded by any of the cities of the West. Toledo is rapidly advancing toward a position among cities of the first class, and is already a great commercial mart on the chain of inland seas which skirt the northern frontier. In the grain trade she has already attained distinction, and enjoys the reputation of being second only to Chicago as a grain-receiving and shipping point. This is shown by the aggregate grain receipts at the three principal lake ports last year, in bushels.

	Flour and Wheat.	Indian Corn.
Toledo .....	14,108,993	1,041,160
Chicago .....	49,952,741	13,623,087
Milwaukee ...	12,337,679	478,309

It may be incidentally mentioned, that while as compared with 1863 there was a decrease at Chicago of about ten million bushels of wheat, and at Milwaukee of over four million bushels, at Toledo the decrease was so small as to be scarcely noticeable.

Let us now look into the details as furnished in the last annual statement of the trade and commerce of Toledo. The receipts of wheat at this port in 1859 were but two-and-a-quarter million bushels: last year they were seven-and-a-quarter million bushels, an increase over 1863 of one million bushels. The inspection, grading, and classification of grain by the Board of Trade of the city are very strict. The qualities chiefly received here are Michigan amber and white, and winter red Western. Michigan wheat is a special favourite with millers at this point, and also with those on the lines of canal and railroads at the East, who manufacture flour for leading markets on the shipboard. Canadian buyers, who visit Toledo confine their purchases of wheat almost entirely to this description, as it is safer to ship on a long voyage than any other, and yields a better article of flour, and more of it than winter red, which comes from Ohio and Indiana. The reason assigned for this difference, apparently in the same varieties of wheat, is that the farmers of Michigan allow their grain to stand in the field until it is fully ripe and very dry.

The receipts of flour during 1864, at Toledo, were a little over one million barrels, being a slight decrease on the previous year. This is attributed to the fact that many manufacturers, especially those of low grades, lost heavily the latter part of 1863, and were not disposed to assume the risk of making the flour, and then awaiting a market; for of this they had had a bitter experience during the two previous years.

The receipts of Indian corn at Toledo fell in 1864 below those of previous years, only amounting to one million bushels. This is attributable to the shortness of the crops of 1862 and 1863, and the heavy demand at the South for army use.

Of oats, there is comparatively little grown in this section of the West, and nearly all the home demand is supplied from points along this line of railroad and canals; 500,000 to 700,000 bushels is the total amount received. The receipts of barley are insufficient to supply the wants of brewers, and the deficiency is supplied from Canada. The facilities at Toledo for elevating and storing grain have been largely increased during the past two or three years, and the city has now capacity for storing nearly 3,000,000 bushels, and to receive and ship daily about 500,000 bushels. The value of the flour and grain received is set down for 1864 at 23,000,000 dollars, of the live stock at 3,250,000 dollars, and of the cured provisions 14,000,000 dollars.

The receipts of wool were very much in excess of former years, reaching about 6,000,000 pounds. Farmers in the vicinity, and throughout the south-west and west, are giving wool culture considerable attention; hence the shipments eastwards will continue to increase, and that, too, of the better grades, as farmers have learned that the profit attends the raising of fine-wool sheep. The business of sheepskins is very large, and appears to be increasing, at present exceeding 750,000. Toledo is one of the most important hide markets of the West, the receipts last year having exceeded 13,000,000 lbs. weight. Ashes, timber, tobacco, and furs, constitute other articles of receipt of no small importance, pointing this lake-town out as a great centre of transit between the Western and Eastern States.

While writing on the trade of this district, we may sum up with some agricultural statistics of the State of Ohio, which are important. In the ten years between 1850 and 1860 there was an increase in the land under culture of 35 per cent., the improved land now being about 13,600,000 acres, of which 4,600,000 were under grain, 7,000,000 under meadow pastures and fallow, 500,000 in orchards and gardens, 404,000 under clover, and 95,000 in flax. In 1863 and 1864, the abstraction of so large a number of labourers for the army seriously reduced the culture of productive crops. Up to the summer of 1863, the war had produced no sensible effect on the market of labour, and 100,000 men had been sent out before the diminution began to be sensibly felt in the operations of farming. One principal reason for this was the increase of machinery, which did the work of fully 50,000 men. But the want of labour was at length seriously felt, and in 1864 the harvest could not be secured except by the co-operation of the town-people and the assistance of female hands in many places. The lands are pretty well distributed in this State; but it will be probably a century before farms will become too small for profitable culture. In 1850, the census gave 125 acres to each landowner in the State; but the report for 1862 gave but 91, the number of owners being 277,000, of whom 240,000 were estimated to be actual farmers. Taking the whole valuation of lands (exclusive of town lots) at 500,000,000 dollars, and dividing it equally among 277,000 owners, the average to each man is 1,841 dollars, about £368. Looking at this as a working capital for a working man, it is no doubt sufficient for a comfortable support. But the real merchantable value is probably double this sum; so that the agricultural population of Ohio is not only in a comfortable, but in a wealthy condition.



## ODDS AND ENDS OF FARMING FACTS.

(89)—*Cabbages as food for milch cows* have been singularly overlooked; the animals are very fond of them, and they appear to increase the flow, while they do not impart any taste of a disagreeable kind to the milk. The soil best adapted for the crop is a rich, strong, loamy, and friable one. It is almost impossible to over-manure cabbages. The best kind for a farm crop is the "Drumhead" or "Sootch," although the "Thousand-head" and "Jersey or True Cabbage" affords a large supply of green food. The seed should be sown in seed-bed early in March in a highly manured soil. The preparation of the field to which the plants are to be removed should be carefully done, so as to secure a considerable depth of well-stirred soil, and be well manured, at the rate of not less than twenty tons to the acre. The plants will be ready for transplanting the end of May or the beginning of June. In taking the plants up from the seed-bed, care must be used to prevent, if possible, the tap-roots being injured. Some think this is of such little importance that they purposely nip off the tap-root, believing that doing so favours the "hearting" of the cabbage. It is scarcely necessary to say that this practice is not dictated by correct theory. The process of transplanting is an important one; indeed, upon the way in which it is carried out depends the future goodness of the crop. Notwithstanding this, it is surprising how very carelessly it is generally gone through with. In this, indeed, as in every other department of labour, there is a right and a wrong way of doing. It is not the right way to make a hole in the ground and thrust the plant in, careless whether the plant is doubled up or not, or whether it is brought in close contact with the soil. If the root is not straight, the development of the plant will be slow and unsatisfactory; and if the earth is not brought up to the plant, more especially if the weather is dry, it will be likely to die altogether, or at least languish for lack of moisture. We have seen cabbage plants so carelessly put in that the slightest pull was capable of removing the plants altogether. They must be firmly embraced by the soil. It is a disputed point whether dry weather is the best for transplanting. Cobbett was a great advocate for transplanting in dry weather and in a dry soil. The general opinion is that the plants do best when the soil has been wet with recent rain, and the weather moist for some days after plants are in.

(90) *If cabbage plants are dibbled-in* at distances of thirty-six inches from each other, and the drills are thirty-six inches wide, 4,840 plants will be required for an acre. The plan of setting-out plants in the angles of hexagons has been recommended, the rows in this case being thirty-one inches wide, and the plants thirty-six inches apart in the rows: each plant will stand three feet from its neighbours on all sides. On this plan, with other widths of drill, the following gives the distance between the plants proportioned to such: Thus, for a width in the drill of one foot eleven inches, the distances between the plants should be two feet three inches; with a width of three feet two inches, three feet nine inches distance; width, three feet ten inches—distance, four feet six inches.

(91) *In every acre of grass*, of an average crop, from 400lbs. to 420lbs. of ash are taken from the soil. The ash of hay is made up as follows, from which will be seen the importance of supplying grass lands with minerals, to restore those fertilizing ingredients so rapidly withdrawn: Of potash, 100 parts of hay have 18.11; of soda, 1.35;

lime, 22.95; magnesia, 6.75; oxide of iron, 1.69; phosphoric acid, 5.97; sulphuric acid, 2.70; chlorine, 2.59; silica, 87.89. Of all the four crops, wheat, oats, barley, and hay, the latter takes the greatest amount of nitrogen from the soil—three parts more than wheat does, five more than barley, and seven more than oats.

(92) Mr. Bowditch puts the *exhausting nature of the hay crop* in this way: "As wheat (ripe), for every 1000lbs. of its weight of grain and straw, takes 10lbs. of nitrogen from the soil, barley (ripe grain and straw) 11lbs., and meadow grass hay afterwards 14lbs., some notion of the quantity abstracted per acre by each of these crops may be obtained when we consider that the average crop of each per acre is thus: Wheat, 25 bushels, of 60lbs.; straw, 1½ tons=48 cwt. Barley, 40 bushels, of 63lbs.; straw, 1 ton=42½ cwt. Hay, first crop, 1½ tons; second crop, 1 ton, or in all 50 cwt."

(93) All sorts of opinions diverse enough are held as to the period when grass lands should be manured, some maintaining "any time" may be chosen, and graphically enough saying that, "any quantity" may be given, and that it is scarcely possible to give too much. This, of course, refers to the farm-yard manure or dung; when artificial or portable manures are used, the best time for their application is in spring. Autumn manuring with dung seems to be the most in favour, and justly so, especially if the dung is long and not easily assimilated with the crop. One great advantage—and it is not always thought of—obtained by the top-dressing of meadows with long manure in autumn is the protection or shelter yielded by it to the grass in the severe frosts of winter. Some who have paid attention to this maintain that fully one-half of the advantage obtained by autumn top-dressing of grass lands is owing to the shelter given to the plants during frosts by the comparatively bulky manure.

(94) *Of artificial grasses* for one year's hay in heavy soils, the following is the quantity per imperial acre: (1) Lolium italicum, 9lbs.; (2) Lolium perenne, 15lb.; (3) Medicago lupulina, 1lb.; (4) Phleum pratense, 1lb.; (5) Trifolium hybridum, 1lb.; (6) Trifolium pratense, 5lbs.; (7) Trifolium repens, 2lbs. For one year's hay and two years' pasture: (1) 9lbs., (2) 15lbs., (3) 2lbs., (4) 2lbs., (5) 2lbs., (6) 4lbs., (7) 4lbs., to which should be added 2lbs. of (8) Dactylis glomerata; and 2lbs. of (9) Trifolium pratense perenne.

(95) The prolific nature and hardy habits of weeds (see Facts 69-70, No. V., New Series), and the rapid ratio in which they exhaust the soil, are points too frequently lost sight of, important as they undoubtedly are. It seems to be very much lost sight of that the ground was "cursed" in this very way, bringing forth weeds in place of food fit for man. They are a two-fold nuisance—they occupy space which should be occupied by the plants, and they exhaust the soil of those fertilizing ingredients which the plants require. It is but poor farming to appropriate soil, space, and manure to weeds. But although the ground has been covered by weeds, it is an exceedingly suggestive circumstance that the curse can be easily changed into a blessing, and that simply by exterminating the weeds. Not only are the weeds taken up from the soil they occupy so uselessly, and the manurial resources upon which they draw left to the proper occupants of the soil, but the getting rid of them brings about that very condition of soil so beneficial to the plants which probably occupy it, enabling them to draw more readily upon

the manurial resources both of the soil and the atmosphere. Hence it is true that the faster the weeds grow, inasmuch as they demand a ready and complete clearing off, so much the more benefited are the regular crops by this clearing off is effected; and it is a curious enough thing to suppose, as has been supposed, that weeds have a beneficial office to perform, urging man to labour in getting rid of them, so that the ban can be changed into a blessing. The rapidity with which weeds propagate themselves need not be wondered at, when we consider how numerous are the flowers and seeds they have; as will be seen from the following, compiled from a table drawn up by that eminent agricultural botanist, Professor Buxnam: (1) Groundsel (*Senecio vulgaris*) has 180 flowers and 50 seeds in each flower, total 6,500; (2) Chickweed (*Stellaria media*), 10

seeds in 50 flowers, 500 seeds; (3) Corn-cockle (*Agrostemma githago*), 370 seeds in 7 flowers, or 2,590 seeds; (4) Red Poppy (*Papaver rhoeas*), 500 seeds in 100 flowers, or 50,000 seeds. We need not wonder at our fields having a red hue from the hosts of this plant which grow in them. (5) Charlock (*Sinapis arvensis*), 10 seeds in 400 flowers, or 4,000 seeds; (6) Corn Sow-thistle (*Sonchus arvensis*), 190 seeds in 100 flowers, or 19,000 seeds; (7) Black Mustard (*Sinapis nigra*), 6 seeds in 200 flowers, or 1,200 seeds; (8) Fool's Paralei (*Ethusa cynapium*), 2 seeds in 300 flowers, or 600 seeds; (9) Wild Carrot (*Daucus carota*), 2 seeds in 600 flowers, or 1,200 seeds; (10) Wild Parsnip (*Pastinaca sativa*), same as No. 9.

## CLOVER AS A MANURE.

Professor J. B. Turner, of Jacksonville, Illinois, in a letter to the *Prairie Farmer*, gives his views upon the subject of ploughing in clover as a manure. He says:—

"I do not think that the common theory, that clover roots run deep, has anything to do with the matter; for they never run as deep as corn, or even as deep as wheat is reported to have done. But here is a whole subject most deeply interesting to farmers, which is as yet almost totally uninvestigated. The extant philosophies on the subject in the books are, many of them, if not absurd on the face of them, at least unproved.

"My attention was first called to this subject by observing, many years ago, that a stray root of asparagus, growing out of the centre of a bunch of fleur-de-lis, without any culture or any manure, but standing with a grass sward all around it, grew much more vigorously than other bunches only a few feet from it highly cultivated and annually manured. I observed the same thing of another bunch standing over a grape-root, but not shaded by the vine. In many other plants I have observed the same thing—namely, that two growing together will grow better than one alone; while, in other cases, two will not grow together at all. I now see from my window seed-paranip stems, near seven feet high, growing out from under the thick shade of a Scotch pine; while others in the open ground near are not half as high. I have also thought that some varieties of the vine received increased vigour and growth from their proximity to the elm, after the old classical fashion of our schoolboy days, when Virgil wedded the Roman 'vine to the elm,' and the teacher made us poor urehins tumble our dictionaries and grammars to find out what he meant, and whether any 'regularly-ordained minister or justice of the peace' was employed in that Roman matrimony. I have also thought that the vine grew better near the root of the cypress, and the peach under several sorts of evergreens, as I wrote to the Horticultural Society last winter, but which ideas their committee did not seem to favour.

"But I am fully satisfied that here is a field of investigation wholly unexplored, which all agriculturists and horticulturists should constantly keep their eyes open to—namely, *what plants are benefited by having their roots over or among roots of other plants*, while the conditions of air and light still suit their tops; and *what others are injured by the same or a similar contiguity?* Also what plants are benefited by coming after other plants, or growing on the same soil on which they have stood, and why is it so?

"We all know that there are many plants which will not thrive at all except in contact with the roots of other living plants or trees; while there are a few that will only grow out of the living tree itself, as the mistletoe and some of the mosses. It is self-evident therefore that the roots of some plants do in fact elaborate in some way food for others; while, it must be confessed, that the reverse of this is still more frequently the case.

"Now I apprehend that the real benefit which clover does to crops consists mainly in these items—

"1. Its power of absorbing and holding the dew keeps the surface of the ground perpetually moist, and thus greatly facilitates all those great processes of disintegration, comminution, and capillary attraction from beneath, and atmospheric absorption from above, referred to in my essay on the culture of crops, to which our State Agricultural Society awarded their last premium on that subject; compared with these mighty processes of nature, the mere mechanical action of the roots of clover, or of hickory trees, even if they run through the solid globe, would be as nothing.

"2. One genus or species of plants undoubtedly dissolves and consumes more of certain mineral elements in the surface soil than others; and, by such dissolution and consumption, of course liberates and dissolves, and leaves in the soil a corresponding amount of free elements, which it does not need or consume in perfect comminution, ready for the use of the next dissimilar crop.

"3. Whatever either the roots or the tops of a plant have gathered and elaborated from either the earth or the air, if ploughed in or left to perish in or on the soil, is of course so much matter prepared for the next crop whose nature is such that it can use it; so whatever any living root gathers from the soil or air, and exudes into the soil from its still living roots, that is either nutritious or poisonous, or injurious to the roots or crops, will make itself manifest from its effects on such crops. For example, some sorts of grass and weeds will grow vigorously quite up under the shade of an orange hedge—some even better there than anywhere else; while young orange plants themselves, and many kinds of crops and plants, will not grow anywhere near or over its roots, however good the light and air may be.

"But I have only meant to indicate that here is a great and wide field for observation and experiment of most surpassing interest and utility, to which all our farmers should keep their eyes wide open, and of which even the first rudiments have as yet scarcely been investigated. I only design here to sketch the more probable outline of this most interesting field of investigation. The substantial, practical feature of all truly scientific or rational cultivation of the soil lies in this direction. It can never be explored or expounded by a few chemists in their laboratories, or a few savans in their philosophical retreats, however wise, useful, or learned; but it needs the million eyes, and ears, and hands of the whole people; and of no people more than the people of these western States, who enjoy opportunities of observing the natural growth of plants, and the alleged as well as real deterioration of soils, as no other people ever did."

## THE LAW OF HYPOTHEC.

After a protracted investigation, the Royal Commission appointed to examine into the nature and working of the law of hypothec, as enforced by the landed proprietors of Scotland, have given in their report. The evidence obtained is very luminous, and, with but few and very weak exceptions, most decisive and conclusive as to the working of the law—or custom, for there is no written law to sanction it. Nor have the landlords any available plea for its continuance, that ought to stand a moment in competition with the gross injustice and injury its action inflicts, not only upon the agricultural but upon the mercantile interests of the country. It is true that by it the landlord is enabled, as he urges, to introduce an industrious poor man into the class of respectable tenant-farmers; but at whose risk and expense? Certainly not at his own; for simultaneously with the engrossing of the lease, and before, or at the instant of, surrendering the land, he sues out a sequestration over whatever and whosoever property may be found upon the land, should adverse circumstances induce him to follow up the sequestration to its final result. No matter, then, how much the tenant may be indebted to the merchant for manure, or to the machinist for his implements or machinery, or to the cattle dealer for his live stock, *all* comes under the fell swoop of the execution, and the landlord secures to the full extent of what is seizable, whilst the other creditors may take the leavings, which in some of the worst cases is *nil*. Such is the first effect of this most unrighteous business.

But the second step—which we have on a former occasion animadverted upon—is, if possible, still more unjust, and is best perhaps represented in speech by the words *legal robbery*. It cannot be too often exposed, until it is utterly done away with; and we therefore state again that, supposing a tenant-farmer sells to a miller or merchant, *by sample*, or otherwise than *in bulk*, in the open market, a quantity of wheat, barley, or other grain, and is duly paid for the same; if he is behind in his rent, his landlord can come down upon the purchaser, and compel him to pay again the full amount, although only the landlord himself is at all aware that the tenant is so indebted. This villanous usage, which has in several cases been put in force during the last two years, has no statutory act to sanction it, and is no more legal, in the strict sense of the word—nor, we will add, more in accordance with the present state of civilization—than the old custom of *black-mail*, which belongs to the same age and the same lawless state of society; so that the law of hypothec ought to have gone into desuetude with the *black-mail*.

The plea that poor men are enabled, by the law of sequestration, to take farms which they would otherwise be quite unable to stock, is a poor argument for the continuance of these customs. *We know* that by them the landlords have been enabled to let their lands at rentals that have astonished themselves as well as those farmers who possess capital, and who are still at times at a loss how to make a profit out of their farms. Thus the landlord in the first instance obtains a rent which he sees it will, at best, be difficult for the farmer to pay. He gives the man credit, it is true, for a year and a-half or two years, before he calls for his rent; but in the meantime the tenant is getting into debt also with his merchant, cattle-dealer, machinist, and other tradesmen, and, not having stock

enough of his own, he takes in *gist* stock of his neighbours, who want more feed than they have on their own land. All these creditors are kept in profound ignorance of the fact that the tenant owes his landlord back-rent, which he is unable to pay, until, to *their* cost, the sequestration, like a hurricane, sweeps off the whole, and puts it into the landlord's pocket, while the hapless tenant and his creditors are left to shift as best they may.

But what is the effect of the enormous advance of rents which this system has produced in Scotland? We have seen that poor men are enabled to take farms by the law of sequestration, because it enables the landlord to secure himself under any circumstances. But what, if a bad season or two bad seasons occur, is the effect upon the system? We can best illustrate this by quoting a letter from a Scottish correspondent, received a few days since:—"It appears," he says, "that the Scotch farmers must have been in a much worse state than even you have represented; for, though you judged partly by the sequestrations, yet it turns out that perhaps not a half, or may-be not a third, are registered, and therefore not published in the *Gazette*; whilst the landlord, unknown to the public, secures the money." Thus the landowner is really the only one who is benefited by the law, the benefit to the poor tenant being only contingent, depending upon exemption from a thousand vicissitudes that may, without any fault of his own, blast his hopes; though the landlord still not only obtains, in some cases, *double* the nominal rent he is entitled to, according to the real value of the land, but has that double rent secured to him by this one-sided law.

Again, what is its effect upon the body of agriculturists in Scotland at this time? Here again we will quote from the letter referred to: "It is clearly proved by the evidence that this law has a material effect in unnaturally and unfairly raising the rent of land to rates ruinous to the man of capital and industry. Very few respectable farmers are now bringing up their sons to their business, thinking it only a sacrifice of them to do it; and there would seldom be any, save for the necessity to have one to help him in old age; but the father even in this case is beginning to look upon it in the same light of a sacrifice of his son's future prospects."

Reason, justice, and common sense would suggest that if a land-owner desires to help and encourage a poor tenant, he should do it at his own risk and expense, and not at those of every one with whom the tenant is connected. The Lord has no right to claim the character of a benefactor, which he tacitly does, whilst he himself is the only one who is really benefited; and that in a double sense—first by obtaining a large nominal rent, far beyond the real value of the land; and secondly by converting that nominal rent into a *real* one by the sequestration that enables him to pay himself by the robbery of others.

As to the plea of surrendering the land to the tenant, we have on a former occasion exploded it. The owner risks *not one farthing* by it, whilst the tenant risks his capital, whatever it may be, his industry, and skill in managing the farm, and his character and credit in the neighbourhood. Such is the effect of this law, which it is to be hoped will not survive the first session of the new Parliament.

## THE CATTLE PLAGUE ASSURANCE ASSOCIATIONS.

It was exceedingly desirable and eminently conducive to check the spread of "The Cattle Plague" to form as many mutual assurance societies as possible, "for assurance against loss in cattle by the disease called the cattle plague," and this has been effected to a very great extent: almost every district in the kingdom has now its Cattle Assurance Association, with specific rules for guidance, protection, and terms of compensation. I regret to say, that for the most part these rules are so loosely drawn up, and indefinitely worded, as to be entirely useless for enforcing a refractory member to obedience. It is only honourable men, who look at the spirit of them, and act upon them, that are alone amenable; compulsory laws are, in fact, only to rule the dishonourable: good men require no bonds. It is, however, imperative that the rules of such societies should be as far as possible clear, distinct, and binding upon every individual member. I send you a copy of one set of rules now before me; they are as comprehensive and as binding as they can fairly be made, without the adoption of the Limited Liability Companies Act. It is under this act alone, I believe, that powers can be given to make these associations legal companies, and thus render every member subject to their rules or laws. How then do these associations stand in reference to legal powers? They are voluntary societies, and stand precisely upon the same footing as Friendly or Benefit Societies, which, to my mind, is a very unsatisfactory position. The members of these societies subscribe to raise a fund to be applied to the relief of sick or infirm members, according to rules made for each society's specific guidance: there is a proper office, under Her Majesty's Government, where such societies may be enrolled; Her Majesty, or her officer, then engages to see that each poor member is righteously dealt with, so far as their funds will permit; when their funds are exhausted no further demand can be enforced. If a member ceases to pay his subscription, he is either excluded by the rules, or by a committee of the Society named for such purpose according to rule, but the Society has no power to enforce the payment of a single subscription. And further, there is this anomaly: Any member suffering from sickness or any infirmity which entitles him to weekly pay can enforce such payment so long as the Society has funds in hand; but the Society cannot enforce the payment of such member's subscription: their only remedy is exclusion; but even failing that, he, so long as he continues a member, can enforce payment of his weekly pay till the funds are exhausted. Of course, such societies take early opportunities to effect the exclusion of defaulting members. The saving feature in these societies is this—that no demand can be enforced against any officer or individual member of these societies, except it can be proved that *they have funds in hand to meet such demands*. Now I apprehend that every Cattle Assurance Association or Society which has not adopted the Limited Liability Companies' Act, and has formed itself into a regular company, is in precisely similar circumstances with Friendly Societies, except the registration of such societies. This is a most important consideration. Mutual Assurance Associations are all right and all correct amongst true and honourable men. They require no further binding than their own promise to pay when called upon. But is every member of these societies to be thus depended upon? Remember, it is not a sick member's weekly pay. It may in-

volve the payment of hundreds or thousands of pounds—yes, of hundreds of millions collectively. Suppose all to be honourable however, and every one pays his calls, there may be such an outbreak of the plague as to ruin numbers. What then is the position of the remaining? It may be a very difficult and perilous one, without members acting dishonourably. The subscriptions of course smaller, the risk much greater. But suppose members act dishonourably, which I fear is more likely; i. e., that a fund is raised, and duly placed to account of the treasurer, and the cattle plague breaks out: the claims soon exhaust the funds, great fears and terror on all sides arise, a call is made upon the members, many repudiate, others decline paying, and thus cripple the society. There is no remedy: payment cannot be enforced. The early sufferers alone receive the benefit. Suppose, again, that the members of another Association pledge themselves to raise a fund upon the first outbreak of the plague within their limits, as a compensation fund. Suppose many members refuse to pay their quota, and no means are known to compel them. The claims must be inadequately met, or there is great hardship and responsibility on those who do pay. It is self-evident that the distribution of a payment over a large number is a much lighter burthen than over a few. It is also very hard and unsatisfactory to a suffering claimant, inasmuch as he cannot enforce his claim unless there are funds actually in hand. It would also be very perplexing how to act in such a case, because if only one member pays up, it forms a fund. It would be better to place the sums, during collection, in private deposit, till the whole could be paid over to the treasurer. It would never do for any small number of members in any society to have to stand the brunt of pressing claims, without a fund to draw upon. It may be said that all these societies are dependent upon the honour and patriotism of their members. I know it. There is, as I have shown, nothing else to depend upon. I have, however, many doubts relative to this honour in the mass, not in the abstract. Wait till the hour of trial comes: many will then find their faith fail: many will withdraw rather than incur heavy calls: heavy payments cool much courage and honour. I have but little faith in these purely voluntary efforts: and should the plague last ten or twelve years, as from 1745 to 1758, it would swamp every one of them. There must be something more attempted. Just fancy that one-fourth of our cattle may be sacrificed, as then. Why, it would require nearly 30,000,000 of pounds to cover the loss. What could our voluntary societies do, with such a sum to pay? Depend upon it there must be other measures taken. These voluntary societies may work well when backed up energetically by the Government. They may form the machinery, but the Government must ultimately supply the motive power—Government must ultimately take up the question of compensation. These societies might be so organized that all relief might come through their recommendations and under their auspices, each in its respective district. The question need not remain long in abeyance. The Government have no power to award compensation without the sanction of Parliament. John Bull don't allow his purse-strings to be undrawn by an Order in Council. But Government might announce that they would receive claims for compensation subject to the approval of Parliament. This would restore confidence, if such claims were ordered to be made

through the many organised societies. It would give them a good standing and no little popularity in the country. In this way they may be made extremely useful. They do now embrace the picked men of the agricultural body, and thousands more would enrol themselves members. As to the amount of compensation to be paid by Government, I would say this: The cattle owner has no equitable right to bear all the loss this cattle plague may entail upon him. It is for no fault or failing on his part that such losses are sustained. It is a national calamity, and the nation should bear a fair share of the loss; but to insure due care and caution on the part of the owner, and to prevent imposition, I would insist upon it, and make it binding upon every owner, to ally himself with some local association as a member, and only through such association shall he receive compensation. I would further re-

gulate the proportion of compensation thus. The associations shall be responsible, and pay one-third of the amount of established claims, and the Government two-thirds. I name this proportion as being fair, owing to the expenses attendant upon keeping open these associations. One great advantage attending this organization would be the virtual legalisation of these societies. Of course if members are only to be compensated through their operations, every member will strive to keep upon correct and prompt terms with them, and these societies on the other hand will take care not to prefer claims till all their demands are met satisfactorily. It would wonderfully conduce to the independence of these associations. I am convinced that sooner or later Government must render very considerable help, and the sooner the better, lest these associations should flag and dissolve.

## THE RECLAIMING OF PEAT BOGS.

### DIFFERENT METHODS OF DRAINAGE.

It would take a long summer's day to tell how the bogs of Ireland could be drained and brought under profitable aration, to say nothing of the large areas of peaty soil in the United Kingdom that are barely half reclaimed from their original state. We cannot, for example, with hardly an exception to the contrary, take a railway pleasure-trip from the British capital in any direction without in a very short space of time finding ourselves surrounded with bog-land almost swimming in water; while in the sister-country it is no great exaggeration to say that the best half of her superficies is live bog! In the north of Ireland the drainage of Lough Neagh would not only reclaim a large territory of bleak, comparatively-barren peat-bog, but add a new county to the province of Ulster at present wholly under water. In each of the other three provinces—Connaught, Leinster, and Munster—immense areas of waste bog could be profitably added to the agricultural resources of the country, and doubtless will be so added at no very distant period of time.

The reclaiming of peat-bog is therefore *per se* an Irish topic; and the drainage of Lough Neagh would of itself form a voluminous subject were we only to confine our observations to a faint outline of what has already been said and written upon it. During the summer of 1844 we were professionally engaged in extensive drainage and embanking operations in the Upper Bann and two of its tributaries; and during the summer floods of that season, it would take the volubility of an Irish tongue to describe the flooded state of the country far and wide on both banks of that river. The low-lying grounds on the Shannon and its tributaries are if possible in a worse state of drainage; and the same may be said of the great bogs that are drained towards the eastern and southern coasts.

The main-drainage or river drainage of Ireland is therefore the first great work that must be undertaken towards the reclaiming of her immense bogs. The proposition is not a very encouraging one; for, when so little unanimity prevails amongst the landed interest of the sister-country, it is no easy matter to see how such a national work is to be determined on and practically completed. The past and present plans of applying to the government of the day for professional skill and to the public purse for pecuniary assistance may be better than doing nothing at all, and that is the utmost that can be said in favour of either; for they are unquestionably both bad alternatives—alternatives that must be avoided before anything like practical success can attend the work. In saying so, it must be borne in mind that we are not throwing out any uncharitable reflections towards Irish landowners; for the major half of the Irish landocracy in question include at the same time the best of English landowners. The physical difficulties that stand in the way of progress are those peculiar to Irish bogs; for they all have their source and origin in the immense peat wastes that on almost every large estate reapproach their owners for the want of thorough drainage! More practically speaking, the greater area of Irish bog can-

not be thoroughly drained on the plans hitherto proposed, owing to its depth; while that which lies at a sufficiently high level for the removal of stagnant water, and the complete aeration of the soil, won't pay interest on the capital required to be invested in the performances of the work, including all *etceteras*! Such are the general conclusions arrived at—more especially as regards the main or great river-drainage works involved.

Whatever force the above conclusions may have had at former periods, in the progress of applied science they at the present time cease to have any weight—the improved means, mechanical and chemical, now at the command of landowners being amply sufficient to enable them to overcome all physical and pecuniary difficulties that stand in the way of the profitable reclamation of Irish bog, generally speaking. There are no doubt exceptions at the two extremes, so to speak—viz., bog lying on too-elevated ground for the growth of corn crops, and, at the opposite extreme, small areas of bog lying below the level of the main drains or rivers, too small in extent to cover the expense of machinery. But such exceptional examples are so few and far between as to be unworthy of further notice. On the contrary, Irish bogs generally are proverbial for their bleak and dreary dimensions, extending far and wide beyond the view of the observer, the two extremes in many cases sinking below the horizon when he is standing towards the middle of the bog, thus inviting as it were all the mechanical appliances of modern times to effect their thorough drainage. Had Lough Neagh been an arm of the German Ocean on the coast of Holland, the last drop of water in it would have been thrown into the sea centuries before now, and the whole area within, far below the level of the ocean outside, swarming with poldering thriving Dutch boors enjoying the fruits of their industry; and had the Shannon, about the drainage of which so much has recently been said in Parliament and out of Parliament, been flowing through our English fens instead of through Irish bogs, the whole of its voluminous contents would have been pitched over high embankments by the sheer force of steam into "new cuts" and "higher levels," and the whole of the bog land thus drained thoroughly clayed and brought under profitable cultivation long before now. But, fortunately for the future of the Emerald Isle, although unfortunately for the past and present, the Shannon flows as it ever did into the broad Atlantic through part of Connaught and Munster, while Lough Neagh continues to remain almost in the very centre of the province of Ulster, and while Irish landowners continue to bamboozle Parliament every session about the drainage of Irish bogs and the English Exchequer on the old plan of governmental gratitation! The Dutch shot ahead of this old rule centuries ago; English agriculturists were not slow to follow the example of their Continental neighbours; and now that Ireland is in the waning half of the nineteenth century, it is certainly high time for her landocracy to join practically in the march of improvement. Hitherto, one of the greatest drawbacks to the permanent improvement of the sister-country has been a blind

credence to the fallacious notion that her moist climate and soil would not pay for skilled labour and improved machinery. Nothing can be more unfounded or unworthy of the age than fallacious dogmas of this kind; and we repeat it is certainly high time, not only for Irish landowners but for all classes of the sister-country, to toss to the winds all such groundless superstition, for the very contrary of this blind credence is in reality the sterling truth, as the future is fast promising to prove in each of her provinces.

Much more practical and enlightened ideas of physical improvement have everywhere of late been fast expanding the agricultural mind throughout the length and breadth of the sister-country; and we aver that before long her extensive bleak and comparatively barren bogs will be no longer a discredit to her agriculture, but the contrary. This is manifest at sight; for the greater the magnitude of the undertaking of reclaiming her bogs, and bringing them under profitable aration, the greater will be the credit due to the master-minds that effect their thorough drainage and complete the other branches of the great work of reclamation. Although we have examined a large extent of the shores of Lough Neagh, and of several of the other bogs in question, and read most of the published reports of other professional men, we are nevertheless far from being in a position to give a practical opinion how any one of the great Irish bogs should be drained, professionally speaking. In some cases it may be possible to destroy the surface vitality of bog by drainage, aération, lime, sand, and clay, without wholly removing the bottom water. If, for example, four-foot small, parallel drains can be got in and kept working by means of open ditches of twice the depth, the stagnant bottom-water under this staple may not require to be pumped out by machinery. But in other cases the more advisable and cheaper plan in the end may be the surrounding of the bog by a high-level main-drain for intercepting and removing the influx water, and then by the drainage of the whole of the interior bog-water—surface and bottom—into this higher level by means of pumping machinery. If the subsoil is open rock or porous gravel, the work of bottom drainage may be simple; for we have known the cutting of a very small vein of sandy gravel drain a large area of live bog, which previously would not carry neat cattle. But if the bog is incumbent on impervious clay, which is often the case, and indeed which may not inaptly be termed the instrumental cause of the bog, deep open cuts to the bottom of the deepest part of the moss, pipage, or tunnelling may be necessary. The drainage engineer has here three plans at his command, besides the several combinations of them which the facts of the case may determine; and by such means we aver that there is not a single bog in Ireland which may not be effectually drained at an outlay of capital much under what the returns would cover under judicious management; for when once the bottom of bogs is conquered, their surface is easily brought under the subjugation of the steam plough.

To this conclusion there will doubtless be many wry faces amongst the owners and tenants of Irish bogs, besides much shrugging of the shoulders at the primary data from which it is deduced. We are no strangers to such indications, having met with an outpouring amount of plain Irish on the spot—i. e., when surveying Irish bog in 1843 and 1844 for large landowners, who were waiting for efficient drainage on the principle of *government gravitation*; and who, for aught we know to the contrary, may still be waiting hopefully but impatiently for the lowering of the Lower Bann, Shannon, &c., but who ought to have surrounded their bogs with high-level drains, and to have started draining pumps long before then, and who will have to employ such machinery were the ensuing Parliament to set about the lowering of all the Irish rivers in question to the heart's desire of their owners! In some cases bogs may be intersected by high-level cuts passing through them by means of embankments on either side, as the Ouse does through the fens of Cambridge and Norfolk, when the water on either side may be pumped into those over the embankments thus formed. Other bogs may be drained by siphons either having a uniform or intermittent flow, or both, as circumstances may determine. The floods of Ireland are large, and suitable provision requires to be made for them, whatever may be the method of drainage; and the more artificial the method pursued, the greater the necessity of attending closely to this practical rule. What may be the lowest area of bog that would justify the construction of machinery

for its drainage is one of those controversial questions which we shall not attempt to solve. We might, no doubt, safely go into the details of several actual examples, varying from a hundred to two thousand acres, did our space permit; but so diversified are the practical data at issue that no one of these examples furnishes a working formula for the drainage of a second. In short, although we are obliged by our limited space to confine our observations to a general view of the subject, yet in practice generalising data must be tossed to the winds, and the facts of each example of drainage be allowed to speak for themselves as it were, thus determining their own rule for the carrying out of the work.

Much of what has been said of Irish bogs is applicable to English and Scotch bogs also, and to a large extent of our English fens, which are not much more than half drained. In point of fact were Irish bogs no better drained than a large area of our fens are, the money thus invested in them would be thrown away. Hence the practical conclusion for the English-fen practice forms no working rule for Irish landowners to reclaim their bogs. In both cases more machinery is required.

#### CLAYING, LIMING, WATERING, AND MANURING.

When once peat-bog is thoroughly bottom-drained, it sinks and consolidates, but remains comparatively barren and incapable of yielding any crops, save heath and the like. Before corn and other cultivated crops can be grown, it has to undergo a series of processes of cultivation and manuring, and these form the subject of our present paper.

An old plan was to plough and burn the inert heathy staple in large heaps, under a slow smouldering fire, spread the ashes, sow, and harrow, by which a poor crop of oats, or turnips, rape, cole, &c., was reaped the first year; but with an increase of staple, and the decomposition that follows the incorporation of the ashes, the subsequent crops improve.

There is present in newly-drained bog a large amount of matter that is noxious to vegetation, while it contains very little available food for the corn and other cultivated crops. Much of this noxious matter is soluble, and may be washed out of the soil by the rains of the different seasons under a proper course of tillage; but it is also easily decomposed, or "rotted out," as it has in some districts been popularly termed, by the introduction of ashes, manure, clay, sand, lime, and substances that both induce chemical change and also supply the elements of food to the cultivated plants grown. But a proper supply of rain-water, or pure water artificially applied, is also essentially necessary to secure the practice of the fertilising process, and the proper supply of this all-important element (water) is often wanting, owing to the effect of drought upon peaty soils. Hence, in a series of dry seasons the process of fertilization is often ruinously slow. Hence, also, one reason why a top-dressing of clay enriches a peaty soil in a very high degree, because of its affinity for moisture, night dews, &c., which enables it not only to supply water directly to meet the wants of the plant, but in the first place to promote the decomposition of the inert vegetable matter that constitutes peat earth.

The work of fertilization is thus a compound process, as it were, consisting of a series of elementary operations of a chemical character that require to be carried out conjointly, in order to produce the greatest effect in the shortest time, and at the lowest outlay of labour and capital. Such being the grand proposition at issue, it is manifest that in large undertakings, such as the reclaiming of the immense bogs that cover such a large area in Ireland, and that in some places of the United Kingdom extend to several thousand acres, in individual and contiguous examples, success will greatly depend upon the proper organization of these several operations, together with the command of clay, sand, lime, water, &c., employed in the carrying of them out into practice; consequently the details of each of the conjunct operations require to be duly taken into consideration, and matured before the work of improvement is begun, whether it be done by the landowner himself or by a contractor.

Of the materials required for mixing with the newly-drained bog staple, clay, sand, and water are probably the chief, owing to the greater quantity of them that is necessary in the process; and it is worthy of special remark, that where bog extensively abounds these abound also, and generally at a distance easily accessible, as if nature had placed them there for the

express purpose of being used in the reclamation of the waste land in question.

The clay and the sand are, for the most part, naturally mixed together; so that when we use the expression clay, practically we mean both clay and sand; and whether in the best proportion or otherwise, it may be advisable in the first place to apply them as they are, in quantity to suit the peculiar circumstances of the case, the effect produced being the practical rule of guidance, which will greatly depend upon their successful incorporation with the peaty staple. Thus, if they are thoroughly incorporated with the natural staple, the effect in harvest will be greater than were they to be applied in lumps requiring the action of the weather for several successive summers and winters to break them down and blend them together so as to form a peaty loam, the sand and clay compost being no longer distinguishable from the original staple.

Small applications of clay will be more easily and perfectly incorporated by being suspended in water, the compost being applied in a liquid form, either on the principle of warping, or on the modern system of liquid-manuring by means of pipage, hydrants, hose, and jet. But when applied to the depth of several inches without an abundant supply of water, the work may be more cheaply done either by railway, or by the raising of subsoil clay by machinery, in accordance with the old-established practice of claying our fen-soils. Such being the difference of the preliminary data, each case may have to be its own rule in the outset. But if the success of future husbandry is to depend upon the artificial application of water to the land by means of pipage, hydrants, hose, and jet, the practical question naturally arises, Ought not such pipage to be effected in the outset, so as to apply the clay suspended in water, as above, and thus "hit two dogs with one bone" as it were?

That air and water are the parents, so to speak, of all fertilizers, alike mineral as organic, is a proposition too self-evident to admit of a practical demonstration; and there cannot be a doubt that it applies to peaty soils of the kind in question in a superlative degree. Such being the facts of the case, the laying down of pipes for the artificial watering and liquid-manuring of the land, and for the application of clay, sand, &c., is the next work in succession to that of drainage, roads, fences, and homesteads in the successful reclamation of peat-bogs to arable husbandry.

By means of pipes of the ordinary size used in liquid-manuring, and a plentiful supply of water, a very large mixing of clay could thus be applied to peat soils at any time, either by hose or jet, or on the principle of warping. In the former case, a larger number of hydrants than those commonly in use would be advisable, so as to reduce to a minimum the heavy tear and wear upon the hose that must obviously be experienced. But in examples of comparatively level land, if a short metal pipe a foot or so above ground were fixed on to the ordinary hydrants, and the land prepared in the usual way for warping, then one or more, or perhaps the whole of the hydrants may be opened and allowed to flow together, the thick, muddy liquid having a head of sufficient altitude and pressure to give it a rapid and scouring velocity, until the open, loose, and porous texture of the peaty soil was thoroughly filled with the clayey warp, the whole field being literally in a sea of mud, sub-divided somewhat similar to rice fields on grounds possessing a gentle declivity. The clay prior to application could be ground in mills analogous to the common process in operation in most brick-fields, the runner either being worked by a horse or by steam-power; or different kinds of mills actuated by steam could easily be made expressly for the purpose. And on shutting off or stoppage the flow of the muddy current through the pipes, water may be thrown in for a short time to wash them out clean, and thus prevent the pipes from being silted up. The object of screwing on a short vertical discharge-pipe to the hydrant is to prevent any back-flow of warp into the pipes at the close of the operation of warping.

As soon as one field was finished in this manner, the muddy liquid could be turned on to another, until the whole area of peat bog under reclamation was gone over for the first time, supposing it to have been subdivided into a number of farms in the work of drainage, &c.

Other operations would follow. Thus, when the water in the first warped field was drained off, partly by the drains below, and partly by evaporation above, and when the soil

was reduced to what is termed "between the wet and the dry," a large grubber or cultivator, actuated by steam, could then be yoked, and the clay thus thoroughly mixed with the peaty staple, the new staple thus formed being, at the same time, effectually aerated, so as to promote those chemical changes and fertilizing processes that immediately take place in newly formed loamy soils of this kind. And if it was found that the first dose of sandy clay was inadequate to produce such effect, a second dose could be applied, and so on for the rest of the fields included in the undertaking.

As to the sources from which the clay and the water would be obtained, no general rule can be given that would apply alike to all cases. Almost all our large bogs would have to be surrounded with an intercepting drain or open cut; while new cuts, at higher levels, would flow through not a few examples; so that, in the majority of cases, there would be a supply of water at more points than one; and if clay cannot be got at them for grinding and mixing, it could always be brought to them by temporary railways in any quantity. Where the clay may be had in abundance from the subsoil, thus forming large ponds, it may be advisable to have a large pond at each farm homestead for the purpose of collecting rain water in rainy weather, and out of which to supply the fields in the time of drought artificially with water, by means of the pipes, hose, and jet. Under such conditions, the facts of each case naturally suggest its own practical rule. And in those cases where clay cannot be got from under the moss at the homestead, then water will have to be brought to the homestead in pipes; and through these pipes the clay may be conveyed in suspension. Thus various plans may be practically carried out into operation, according to the peculiar circumstances of different examples. One more may be specified. In large undertakings, pipes for applying the clay and water may be temporarily laid for the purpose on the surface of the newly-drained and ploughed bog land; or a main pipe only could be thus laid along the road between the different farms on each side, so as to supply the liquid manure and water pipes of each farm with warp from a common source, situated at a distance, where there was an abundant supply of clay and water at command of the proper quality. These main pipes could be made of a form so as to be readily screwed together and unscrewed, when to be removed to another place for claying a second and third series of farms, and so on, until the whole bog was finished. In the formation of roads and fences, and the conveyance of materials for draining and building houses, single lines of temporary railways would be advisable on the score of economy; and these temporary lines of railway could remain until the land was clayed and brought under aration, so that the main pipes for claying could be laid down alongside these railways, and also be removed again, at very little expense apart from the expense of the railways and main pipes themselves. And to a contractor or landowner both these would possess a certain value for similar jobs, at the conclusion of the work of reclamation, so that a small amount of tear-and-wear per acre is all that would have to be set down against the newly-reclaimed land. What that outlay per acre for tear-and-wear of railways and main pipes may be, will depend upon circumstances, which of course cannot be supplied in a general notice of this kind. But in the most expensive cases it may safely be set down as fractional, and certainly no bug-bear to frighten any landowner or contractor, for it is manifest that the returns from improvements thus effected will yield ample interest on the capital permanently invested.

The mixture of clay, sand, and water with the natural bog-staple may not be sufficient to produce the desired fertilizing changes without at the same time a suitable dose of lime and manure; consequently these will have to be applied by the landowner before his bog-farms can be said to be in a crop-bearing and tenantable state. But into details of this kind we need not enter.

From these general and desultory observations it will readily be seen by the practical reader that the progress of steam in the various operations of farming offer many facilities at the present time for the reclamation of our peat bogs, that were not at the command of landowners and contractors a short period back. It is therefore the bounden duty of all landowners who possess large tracts of peat bogs to shake up themselves and think anew, in order to see what can be done in the matter to



their advantage. The steam plough and other cultivators are modern appliances which would enable some bogs to be cultivated long before they would carry the feet of horses or neat cattle. And when we add to these seed and manure drills, also actuated by a wire rope, the boon to both landowner and those entering upon the tenantry of newly-drained bogs is not very easily estimated at its practical value. It is, however, when an enlightened view of the whole appliances of modern

times is taken, that the work of reclaiming our extensive bogs, Irish, English, and Scotch, appears in its true light; and were it thus seen by those more immediately interested, the bleak and barren regions of bog that have so long disfigured the face of the country would soon, under the effective operation of such appliances, be converted into fertile fields and well-stocked farms, supporting an increasing and prosperous population.

## THE LONDON AND PARISIAN MODES OF TREATING TOWN SEWAGE.

### ITS UTILIZATION.

It seems to be the fate of what really is an important question connected with agriculture, namely, the treatment of our town sewage, to be subjected to a perpetual ebb and flow of public opinion. Like some floating matter on the verge of the sea shore, it is impelled onwards to the edge by the flowing, and then taken back to the depths by the receding sea; it is always in motion, yet never gets nearer what to one would seem to be its final destination. The movement of to-day was prefigured by that of yesterday, and that of to-morrow will be characterized by all the features of what may be paradoxically called its stationary motions. Our town sewage question is indeed a vexed one: while all are agreed as to the importance of its claims, a remarkable diversity of opinion exists as to the mode by which those claims are to be met. One extreme view is that town sewage is available in every case, the opposite being, we need scarcely add, that it is available in very few, if, indeed, as some are inclined to maintain, in any case connected with the practice of agriculture. In this, as in other questions, the middle course is the safest one to pursue. When we look to what has been done in this country during the last twenty years, and on the continent for centuries, in the utilization of the refuse of our towns, surely it is going too far to say that it is not and cannot be made to some extent available in the practice of agriculture. Difficulties, and those of no ordinary or easily overcome kind, assuredly are met with; but it is questionable how far these owe their existence to the inherent nature of the system of utilization, or arise from the way in which this utilization has been attempted to be carried out. But granting the number and portentous nature of these difficulties, we can see nothing in them to prevent their being overcome by the combined exercise of the chemical and mechanical skill which in other departments have done so much to raise our country in the ranks of civilized nations. We have in other matters bought our present position at a costly rate; every step has been gained by a large expenditure, and those steps have not always been made in the forward direction, the one made to-day showing only the false one taken yesterday—not less must we expect our progress to be effected with a large expenditure of time and money in this same matter of our town sewage. The question is assuredly one worth settling, and settling well; for it possesses a double interest to all of us, in town a sanitary and in country an agricultural interest. And we think that these interests are not incompatible, nay, that they are compatible in the widest and highest sense. The commonest things around us tell us of change and decay, but science teaches us that there is no such thing as loss of matter; the decay of one thing gives life to another; the refuse of to-day gives us the food of to-morrow; and it is but the working of a natural law which gave, as has been finely expressed, to the snowdrops and violets which covered the heights of Alma, and bespread the fields of Balaklava, all the richer colour, and all the sweeter fragrance, from the rich life-blood which, so to speak, watered their roots.

The subject then, is one of high natural interest, of importance to dwellers in towns as well as to those who reside in the country, and is worthy of being kept in view till speculation shall give rise to realization.

The two modes by which town sewage is proposed, at the present time, to be made available for the purposes of agriculture, may be typified by those which are carried out in London and Paris. These we may designate respectively as the "water drain" and the "cesspool system." Let us briefly glance at the

peculiarities of these two systems. The London, and which is fast becoming the provincial system also, is to arrange a system of tubular drains in connection with the houses and the main sewers, by which and through which the faecal refuse of the houses is led off at once by the vehicle of water, the ultimate place of destination being the river or stream adjacent to the town or village which requires to be drained. If the principle of speedy removal is the correct one, if getting rid as quickly as possible of the faecal matter of our houses is "the be-all and end-all" of the matter, there can be no doubt, or at all events but little doubt of the efficacy of this water-conveyance plan. But it assuredly, however perfect in one point of view, gives rise, so say some, to grave imperfections in another and not less important one. But, indeed, this perfectness in the one point referred to is really not attained; for it is far from securing, as its out-and-out advocates say it does, the full sanitary requirements of the towns. If the system of water-conveyance removes the nuisance quickly from the one neighbourhood, it as quickly conveys it to another—it is but a shifting of the evil. For the accumulated products of many localities, given up in all the fierceness of their filth to the rivers or streams, rapidly bring these into a condition little better than that of open sewers, thus creating in an extended way what in a minor system is intended to prevent. But this shifting of the evil involves a moral point, which Mr. Page, the well-known engineer, thus very forcibly puts: "If we are bound to remove a nuisance from ourselves, we are morally bound to consider the consequence of transferring it to others." As a rapid conveyor of the faecal matter from our houses to, no matter where, the water-drain system of conveyance may be pronounced pretty perfect; but, as above stated, if perfect in this way, it gives rise to great imperfections with difficulties in another, and this in an agricultural way. For it so happens that the medium which acts as a rapid conveyor of the sewage—namely, water—acts unfortunately as a rapid diluter of it, lessening its value as a fertilizer, bring about the very difficulty which renders so apparently hopeless the realization of any scheme for utilizing, on a grand scale, our town sewage. We are not forgetful of the argument that the abundance of the watery element in the town sewage is so far in favour of any plan for carrying it into the country, at a distance from the town where it is produced, inasmuch as from its extreme mobility, and the cheapness with which steam-power can be applied to aid this, a large amount of fertilizing matter can be obtained at as cheap a rate, if not cheaper, in this form, than in that of any other. Refraining, however, in the meantime from going into the estimates by which this opinion is upheld—which, by the way, are doubtful enough, in point of accuracy—it is sufficient for us here to point to what may be considered as axiomatic, that the more concentrated a manure is, the cheaper it will be to the farmer; this consideration gaining force the further his farm is situated from the place in which the manure is produced or sold. By the plan of water-carriage, whatever may be its advantages in quickly conveying manure, very quickly deteriorates its fertilizing value, a per-centage of the cost of conveyance is taken up in conveying water, so that while the farmer is paying for one thing he finds that he is obtaining another. True, it appears that according to Board of Health estimates (not always correct), while one ton of solid manure can be conveyed a certain distance for 15s., for the same money 75 tons of liquid town-sewage can be conveyed the same distance. It is not stated, however, whether the 75 tons of town-sewage is worth the one

ton of solid sewage—an important point, and not to be passed lightly over. Thus Mr. Lawes, in the celebrated discussion at the Society of Arts some years ago, had the following: “If the 75 tons of sewage, so delivered to him for 15s. were to be in the state of dilution, which existing facts led him to think it would probably be, it would contain only about  $\frac{1}{3}$  of the average annual excrements of one person, which, allowing liberally, he had valued in the solid form at 6s.; and however ardent an admirer Mr. Mechi might be of water, he would perhaps agree with him (Mr. Lawes) that the extra cost of 9s. or 10s. would be paying rather dear for the solution of 5s. or 6s. worth of manure.” We know that the valuation of Mr. Lawes as to the worth of the sewage is considered by the advocates of the water-system as below the truth; but even when giving a much higher margin the loss from dilution is evident enough.

The difficulties, however, of the diluted system being so apparent, it has been attempted to utilize the solid matters of town sewage only. However feasible this scheme appears at first sight, it is in reality surrounded with difficulties which hitherto have been found insurmountable. In the first place, it seems conceded on all hands nearly that the chief fertilizing materials of town sewage remain in solution, and that the solid matters extracted from it, however bulky, and in this sense valuable to a certain extent as a manure, are in reality of little fertilizing value. The result of all trials may be named in that of a series instituted by Messrs. Hoffman and Witt, from which it appears that “six-sevenths of all the fertilizing constituents are in the soluble form, and that in the liquid which results from the deodorizing processes.... a very considerable proportion of the soluble agents of the original sewage remain unremoved.” On this point another authority says: “In fact, so small is the amount of valuable manurial constituents shown to be contained in such solid sewage manures, that they could only be useful if applied to the land in several times as many tons per acre as would be required in hundredweights of guano or the *pure dry excrement*. It is obvious that such a manure would, on account of the cost of carriage, command no price at all beyond a very limited distance from its place of manufacture.” This last sentence in point of fact, contains a comprehensive statement of the other difficulty attendant upon the use of the solid parts of sewage as a manure. While glancing at the use of sewage in its normal or liquid form, we pointed out the advantages of concentration in a manure, and the loss sustained by the non-concentration in the liquid sewage: this loss is, however, still greater in the use of the solid parts of sewage. Investigations undertaken in connection with the use of the solid sewage—obtained by treating the liquid with lime (by far the best process yet introduced)—show that beyond a certain limit of distance from the manufactory in which the solid manure is made, its use would not pay for the carriage; and that, seeing that six times as much of the solid sewage would be required to fertilize a given space of land, as of guano, it would be the cheapest mode to use guano even in the neighbourhood of the works where the solid sewage is made. At a distance of five and ten miles from the manufactory the cost of carriage would be *six times as much* as of the quantity of guano required to produce the same effect. At a distance of fifteen miles, while guano costs, in carriage and spreading, £11 15s. 9d., the quantity of the solid lime sewage required costs £16 14s. 6d. At a distance of twenty and twenty-five miles, the costs stand respectively thus—guano, £12 0s. 9d., £12 5s. 9d., and the solid sewage, £17 4s. 6d. and £18 14s. 6d.

Such, then, may be taken as a rapid glance at the present position of the “London” system of the tubular or drain sewage system, and of the difficulties which it inaugurates at the very threshold of any plan by which it is proposed to utilize its products for the purposes of agriculture. It is not here our purpose to show how or what means have been proposed to obviate these difficulties; suffice it to say that at present they are considered so very difficult to be overcome that many who have given their attention to the subject seem to think that it will be better, and in the long run cheaper to do away with the system altogether by which these difficulties are created, and to inaugurate a new one which will present none of them, but which will on the contrary, give us the fecal refuse of our town population in that highly concentrated form which will be best adapted to the purposes of the farm, and which will give, in its

ready sale, an ample return for the expense of collecting it. It will perhaps startle some of our readers that the type of this new system is the “cesspool system” of Paris: of course this is to be modified and brought more in accordance with the sanitary and chemical requirements of the day. So long have we been accustomed to consider our tubular water sewage system to be correct in principle, and the only practical way in which our town sewage can be disposed of; and to such dire results of the horrors of cesspools have we been treated by Boards of Health and sanitary savans, that any proposal to leave the tubular and return to the cesspool system may well be met with considerable wonder. We have said that the type of this new (and by many dabbblers deemed heretical) system, is to be met with in the Paris system of treating fecal refuse, let us glance then very briefly at what this system is. As a rule, the fecal matter is not diluted with such quantities of liquid as with us. Those who have visited Paris, and walked observantly along its pavements, must have noticed in many districts the multiplicity of iron gutters or open channels which cross there and lead to side-gutters. These are laid down to lead off the greater portion of the water resulting from cooking and cleansing operations of the household, the ultimate place of deposit being the sewers which communicate with the river Seine passing through Paris. All the dry refuse which with us is placed in the ash-pit—and much in the water-closet—is taken out and deposited in the streets at midnight, from whence it is taken at an early hour by scavengers. These heaps of refuse give occupation to a whole army of *chiffonniers*, who turn them over to collect the rags, &c., &c., which are mixed up with them, and the selling of which constitutes their sole means of existence. The result of these two arrangements is that little is left of the house refuse to mix with the fecal refuse, save the slops of the bedroom; so that the matter is left in a much more concentrated form than with our system of tubular drainage. The Parisian houses are generally very liberally supplied with water-closets or “cabinets”—indeed, in large houses, each floor is generally supplied with one. The pungent odour, which as some of our readers doubtless have been hailed with on their entrance to a Parisian cabinet, gives evidence at once that there is a peculiarity connected with its management foreign to the London system with its stench traps and liberal supply of water. The cabinet consists usually of an earthenware basin, communicating directly with the pipe which leads the matter to the cesspool below—the opening to which in the better class of houses is generally, but in the lower classes rarely, “trapped.” The trap consists of a moveable lid or flap, which seldom fits closely. As water is laid permanently on to comparatively few houses, the supply is obtained from a pitcher or vessel which is generally found to have a place in the corner of every cabinet, its neighbour implements being a long stick and a broom, by the use of which the action of the water in cleaning out the basin is aided, and its use economised. It is scarcely necessary to say, that such being the arrangements to secure a rapid cleansing off and carrying away of the contents of the basin, they are as seldom as possible put in force, a thousand excuses, many of which will be obvious enough on the slightest consideration, being made for not keeping a supply of water, and giving the necessary care.

The matter from the cabinet is led off at once to the cesspool by the pipe. The cesspools of Paris may be divided into two classes, the “permanent” and the “moveable.” The permanent, it is almost needless to say, are excavations made in the ground, and are often, especially if of old construction, found to be very defective, allowing a large portion of the contents to percolate through the surrounding material. The moveable cesspools often consist of simple barrels, which hold the solid and liquid matters combined; but in other and improved arrangements, an apparatus is used by which the liquid portion is drained off, leaving the solid in a receptacle capable of removal. It is not here our intention to describe the means by which the permanent cesspools are emptied of their contents, or how the moveable cesspools are conveyed from the premises, these operations being conducted on a somewhat gigantic scale by public companies provided with appliances more or less complicated: we propose to describe only, and that very briefly, the method by which the contents of the cesspools are, on the large scale, made into a form easily available as a manure. The fecal matter is taken to one of the *soieries* in the neighbourhood of Paris, either to that at Montigny or at

to that at the Forest of Bondy. The process of preparing the manure is at once slow and anything but savoury in its details. A number of basins are placed in communication with one another. To the upper ones of these the fecal matter is supplied, the liquid draining off into the lower ones, leaving the solid portion in the upper. After the lapse of many months, this solid portion assumes a consistency of half-liquid mud. By cutting channels across the mass it is further relieved of its liquid; and when considered dry enough, it is removed to the drying-ground, where it is broken up by a process of harrowing. It is then placed in large heaps, and allowed to remain thus for a considerable time. Large portions are then dug out from the heaps, broken up into pieces, and carefully freed from all foreign substances. It now assumes the form and name of *poudrette*—a substance which has the appearance of “a mould of a grey-bluish colour, greasy to the touch, finely grained, and giving out a particular faint and nauseous odour.” Notwithstanding the long exposure to atmospheric influences the materials of which *poudrette* is subjected to, it possesses a comparatively high manurial value. Thus M. Paulet, in his work, “Theory and Practice of Manuring,” gives the following table, from which will be seen its value. Taking for a standard good farm-yard dung, which in every 1,000 parts, 4 of nitrogen, and assuming that 10,000 kilogrammes of farm-yard manure are required for a hectare of land, the quantities of *poudrette*, and of some other animal manures required to produce a like effect, would be as follows:—

	Kilos.
Human urine, not fermented ... ..	5,600
Poudrette of Montfaucon ... ..	2,550
Human excrement, mixed ... ..	1,333
Liquid blood of the slaughter-house ... ..	1,333
Bones ... ..	650
Average of guano ... ..	512
Urine of the public urinals, fermented and partially dried	233

Such is, or was, the Parisian system of parting the town fecal matter, a system which, modified, some are now proposing to establish in this country. We say “was,” for, in the process of what may truly be called the re-building of Paris, undertaken by the present Emperor, the system above described is more or less modified; and an approach to the London system of tubular drainage is likely soon to be, if not already begun. The modifications alluded to have for their aim the storing up of the matter in a condition which will give rise to no unhealthy action, till it is required to be taken away, and to take it at once to the districts where it is required for agricultural purposes. We see from the above table the high value which human excreta, solid and liquid, have as manurial agents. One great object, then, in the new system proposed, is to maintain this high value as much as possible. To this end it is considered an indispensable feature of the plan that no water whatever should be allowed to mix with the excreta. This makes the proposed system, then, the very antipodes of the “tubular” drainage system, the very existence of which is dependent upon a liberal supply of water. Of course some plan, probably that of the tubular drains, must be used to take away from our houses the liquid resulting from cleansing and cooking processes. But this is quite a distinct matter, and has no connection with the treatment of the excreta of our population, which make up, in point of fact, the main manurial value of our town sewage; and to which, therefore, the agricultural interest more particularly belongs. The requirements of the new system cannot be better stated than in the words of Mr. W. B. Adams, who has given his attention to the subject. “As chemistry has been successful in converting filthy potato-oil and coal tar (see *Johnston's Chemistry of Common Life*) into delicate perfumes, it is no doubt chemically possible to convert all the waste material of a household into innoxious and not unpleasant circumstances. Two considerations are requisite; first, that it be cheaply done; secondly, that it may not diminish the value of the materials as a manure, by locking-up, as it were, the ingredients so firmly as to render them insoluble in the ground for the purposes of vegetation. To accomplish this is the business of the chemists. If the same skill and energy be put to work that has accomplished the conversion of other noxious substances into perfumes we shall not be long at a loss.” But the mechanical requirements are still to be met. The following is Mr. Adams's views on this point: “To use the disinfectants we need portable cesspools without the access of water

as in the ordinary plan of closet, in which cesspool or vessel the disinfectant may lie. It should be a vessel upon wheels at a level with the yard of the house, and beneath the opening of closet or closets, with ample space, so that falling matter may certainly pass clear of the walls. These cesspools should be furnished by companies, who would take them with their contents to discharge into the covered railway-waggons or barges and replace them with empties. In this mode the material, undiluted with water, would be transported cheaply, and be as readily saleable as guano.” We may here note, in passing, that the mode of saving and treating excreta introduced by the Rev. Mr. Moule is one of the most recent, and bids fair to be one of the most successful of the plans under this class.

In these few remarks which we have in the present paper given, on a very important subject, closely concerning agriculturists, we have placed before the reader a brief statement as to the position which the question of the treatment of the fecal refuse of our towns at present stands. The whole presents points which are well worthy of being discussed calmly. It is one of the features of an enlightened and liberal mode of treating scientific subjects, that the theories or opinions allowed by those who differ with us are received courteously, and their claim to notice quietly investigated. This is not only a pleasant mode but it is also good policy for securing them the fulness of investigation with the utmost freedom in discussion; thus the main object with all of us, the best and quickest settlement of the question, is greatly aided. However viewed, the question naturally divides itself into two grand classes, the town and the country interests. The town or the sanitary interests are quite distinct, or at least should be, from those of the country or agricultural ones. The primary duty of the town is to see that the sanitary requirements should be met, and in this best possible way, whatever be the cost. They have no other point to consider—we speak advisedly—but this; all other considerations are merely secondary ones. The duty of all corporations is to free the inhabitants from a nuisance; and they have as little right to grumble at not being paid to do this, as they would have to grumble at the expense of protecting the community from thieves. The dealing with the nuisance is their primary duty; a secondary consideration merely is that which takes into account the mode of making that nuisance pay the expenses of its own removal. As for agriculturists, all that they have to concern themselves with is this, namely, to see to the value of such manurial substances as may be offered them, to put the matter, in fact, upon a strictly commercial basis. It is assuredly their interest to use materials which will pay, and if they are not so used, the towns may rely on it that their value is not sufficiently high to induce their usage. But it is mere absurdity on the part of some to continually indulge in wrath as to the folly of agriculturists in bringing guano from long distances, and resolutely wasting materials nearly as valuable lying at their own doors. This, so far as town sewage is concerned, is all nonsense; agriculturists have no right of interference with town arrangements. The whole matter must of necessity become liable to the action of the laws of supply and demand which regulate the other departments of our industries. In ordinary transactions the seller takes the material to the buyer, or who is likely to become one, or at all events he makes some arrangements by which the buyer can obtain his wares; and, if the seller does not or will not undertake these preliminaries, he has no right, we conceive, to grumble at the non-disposal of his goods. Just so with this matter of the final disposition of the fecal matter of our towns, so far as these towns and the agriculturists are concerned. If the corporation really have a valuable material to sell which it would pay to take or to allow to be taken into rural districts for manuring purposes, it is clearly their interest to do so; and it is as clearly the interest of the agriculturist to avail himself of this supply. That this has not yet been done is a proof, we think, that the value of the materials the towns have to offer is not high enough; it is no proof that the agriculturists are blindly indifferent to it. If it is worth buying, it is at all events worth offering. That it has not been so is evident enough, and it remains to be seen how far the modified Parisian system, which we have actually discarded, is likely to present facilities by which the value of our town excreta can be raised to the paying point. We have opened up many points, the further and occasional consideration of which may hereafter elicit points of value to our readers.

B. S. B.

## BLOOD-LETTING AND PURGATIVES,

## THEIR IMPROPER APPLICATION IN HORSES, CATTLE, SHEEP, AND OTHER ANIMALS.

By HUGH FERGUSON, Her Majesty's Veterinary Surgeon in Ireland.

I am fully aware of the great difficulty in rendering such a subject intelligible to the mass of general readers, or to any others than those who have received a medical education; but when I take into consideration my firm belief that far more animals have been killed by blood-letting and the injudicious administration of purgative medicines than have ever been saved by their most judicious application, I think it not an unworthy, though, it must be admitted, a very difficult task, to endeavour to impart, in a popular form, as much information as will lead to the correction of the prevailing errors on so important a point in the treatment of animals, either as a curative measure, a preventive of disease, or as a means of rendering them more healthy, more vigorous, and more disposed to assimilate to their frames, through the medium of their digestive organs, the nutriment taken for their support.

Although blood-letting has been advocated, from time immemorial, for the accomplishment of these purposes, for the great majority of them it is—in fact, for all but one—as a general rule, worse than useless, being absolutely injurious. Yet it is with horsemen, farriers, cattle-proprietors, herds, and, to a great extent, even among veterinary-surgeons, a time-honoured custom that has still its strenuous advocates, notwithstanding its being opposed to every principle of common-sense, and to all rational deductions from experience. The only purpose for which blood-letting is admissible is as a curative measure. It should be held as an axiom that *it is quite time enough to abstract blood when doing so has become necessary from the presence of disease*. I wish it to be also understood that even the presence of disease ought not to warrant "blood-letting" as a remedy, without its being first taken into consideration whether or not the disease is of that particular nature that is likely to be benefited by the operation; for although an inflammatory action may be its very essence, it may be one for which the loss of blood would be injurious.

Even in acute diseases, whether blood-letting is indicated or not will depend on the part—the tissue or organ—that is suffering from the inflammatory attack; also on the character or type of the malady. For instance, blood-letting is injurious if the nature of the disease be typhoid, very depressing to the powers of life, shows great debility of the nervous system, a languor in the minute ramifications of the circulating vessels, or a tendency in the fluids, and those structures in which they predominate, to putrefaction. These form prominent characteristics in many epizootical (generally called epidemical) affections, such as influenza and distemper in horses, typhus in cattle, and the disease at present committing such fearful ravages among the sheep, particularly breeding-ewes, of this country. In this latter affection, so great is the tendency to decomposition, that in inveterate cases it seems absolutely to commence even before the extinction of life, and it is almost an impossibility to cure or save the meat of such animals, no matter how carefully salted, or however early in the affection they may be slaughtered, for the purpose of converting them into food, as is frequently attempted.

In this sheep disease the vital force which endows the living frame, in a healthy condition, with the power to resist ordinary chemical actions between its constituents, becomes enfeebled from the inclemencies and privations to which the animals were exposed during the past winter. Thence arises the putrefactive tendency. The ewes, being the least able to resist these prostrating influences, suffer the most. In this disease the blood, as a supporter of life, becomes deteriorated in quality, and the animals die from its being unable to efficiently fulfil its various functions. In many cases the *post mortem* examinations show, according to generally received notions of pathology, no sufficient amount of disease in any particular organ, to account for a fatal termination; although when the deterioration of that vital power, which in the healthy animal resists chemical decomposition, is considered (which is most

evident from the state of the tissues even when an animal is killed before the disease has run its natural course), there is recognised quite sufficient to explain the cause of death, without seeking it in any particular organ, although in many cases serous effusions are found in the chest, abdomen, and brain, and sanguineous ones within the structure of the lungs and other organs, causing, along with the general tendency to decomposition, a softened destruction of their tissues.

This peculiarly diseased state of the system is the very reverse of any of the active inflammatory ones in which blood-letting is admissible. No excess of vascular action can be discerned in any period of the disease. If the pulsations of the heart are increased in their rapidity, their force is found greatly enfeebled. Let such a state of disease be called what it may, it certainly is different in every respect from active inflammatory action. Yet, blood-letting has been recommended, and is by many practised for it as a remedy. The operation but accelerates death. It is blood of a better quality, and more of it, that is required; and this cannot be accomplished by diminishing the quantity of the already too impoverished fluid circulating through the debilitated and fast decaying system of the affected animal. Such a procedure but confirms the putrefactive tendency. I have more fully alluded to this sheep malady than to any other disease of the many to which almost similar observations would be applicable, in consequence of its being one which is very prevalent at present in the west of Ireland, and which offers a striking example of a type of diseased action in which blood-letting is contra-indicated, as well as from its also being one the nature of which, I conceive, is misunderstood.

I trust I shall shortly be enabled, through the medium of Professor Cameron's assistance, to present a chemical analysis of the blood as affected in this malady, compared with that fluid in the healthy animal. I feel assured that in studying the diseases of animals, what I call pathological chemistry has hitherto been too much neglected, and that its proper cultivation cannot otherwise than lead to most important and practically valuable results. Chemistry has done much in the practice of medicine towards alleviating human suffering. I am of opinion it is capable of doing still much more for the breeder.

Many horse-proprietors and stock-owners are in the habit of having their animals bled periodically, some once, others twice a year, as a sanitary measure, either for the prevention of disease or from the erroneous notion that loss of blood is conducive to muscular vigour and a tendency to a more profitable assimilation of the food into flesh and other tissues. Though this custom seems to have the sanction of long established usage, nothing could be more opposed to reason and all known principles of physiology. As well might a pugilist be bled with the view of developing his physical force and endurance to the utmost for an approaching prize-fight, or recruits bled previously to the commencement of their drill, or the more veteran soldiers lose a portion of their vital fluid with the view of enabling them the better to endure the fatigues of a campaign, as to bleed horses for the purpose of getting them into that state of condition necessary for severe work, or to bleed cattle as a sanitary measure, as a preventive of disease, or for the purpose of increasing their "thriving" or fattening tendencies. Yet, the malpractice is one of extensive and every-day occurrence.

When, from an attack of a disease indicating the advisability of blood-letting in an animal that has been subjected to repeated loss of blood as a sanitary measure, recourse is had to the operation, its efficacy will be found greatly lessened from the constitution having become habituated to periodical losses of blood. Blood-letting has been strenuously advocated as a preventive measure, particularly against epidemic, epizootic, infectious, and contagious diseases. The loss of blood under

such circumstances has quite a contrary effect to the one desired. The tendency to absorb from the surrounding medium is greatly increased. Many animals that would escape the poisonous influence had they not been bled become affected; their systems, previously debilitated from loss of blood, too often succumbing to the disease, the accession of which, in many instances, might be avoided by refraining from the use of the lancet. For I state it as a positive fact, the result of much observation, experience, and study, that blood-letting, instead of preventing the attack of these diseases, but predisposes the animals to become affected by the peculiar influences which produce them, whether epidemical, endemical, infectious, or contagious. Before entering further into the question, it is desirable to give some information as to the effects produced by loss of blood on the animal system; to understand which, they should be studied as produced on animals in such a state that there is no other influence in operation to affect the phenomena. To do this, the study must be made on animals in a perfectly healthy state; for the effects of blood-letting are greatly modified by the presence of some diseases—they are widely different in some diseases from what they are in others. In some, the loss of blood, if not pushed too far, and yet to a sufficient extent, increases the chances of life's being prolonged by the operation; while in others, blood-letting but accelerates, if it do not actually cause a fatal termination to the malady. If blood be abstracted from a healthy animal to a sufficient extent to produce an immediate and remarkable impression, a tendency to fainting, or that phenomenon fully developed, is the effect produced. The animal evinces signs of distress, the respiration is increased, the eye becomes languid, its stare vacant; the pulse, at first rapid and full, becomes weak, thready, and irregular, then imperceptible; the frame trembles; the limbs totter if the animal is moved; they at last become unable to support the superincumbent frame, and the animal falls down insensible; in fact, he faints. Fainting from loss of blood is a wise provision of nature. It is the result of not enough blood's going to the brain. During the faint, the circulation of the blood seems partially suspended, and the wounded vessels have time to contract, as well as the blood at their opened parts to coagulate and plug up their bleeding orifices, thus preventing bleeding to death—a wonderful provision of Providence. A soldier on a battle field receives a wound dividing some large vessels; with every pulsation of the heart the blood is squirted out in jets; the brain receives an insufficient quantity of the vital fluid; the heart almost entirely ceases to act; the wounded man faints; and well for him he does, for, during the suspension of the circulation, the blood coagulates in the vessels where they have been wounded, forming a plug that prevents the recurrence of the hæmorrhage on the heart's resuming its proper functions. 'Tis thus the fainting of the wounded, whether man or brute, so often prevents "bleeding to death."

The recovery, or, as a sailor would say, the "righting," of the system from loss of blood is generally called "*reaction*," which varies in its character according to circumstances. Sometimes the animal sinks, instead of recovers, dying from the loss of blood. On a knowledge of reaction depends a person's being able to properly understand the effects, application, and misapplication of blood-letting. Therefore, although the subject may not be amusing to the general reader, it is one a knowledge of which is indispensable, before anything like correct notions can be obtained as to the application of blood-letting as a remedial measure either in brute or human medicine. The varieties of reaction not being properly understood has caused a greater amount of lives being lost, both in man and the domestic animals, from blood-letting, than has ever been saved by even its most judicious application. There is a state of the system frequently brought about by blood-letting so closely resembling inflammatory action that it is treated as such. Repetitions of the blood-letting is had recourse to, under the mistaken idea of subduing what is erroneously thought to be an inflammation. The symptoms get worse instead of better, the letting of blood is persevered in, and the animal dies—not from any inflammatory action, but from excessive reaction, caused absolutely by mere loss of blood. This state can be induced, even in the healthy animal, by repeatedly abstracting small quantities of blood from the system. It is the true cause of the great mortality among animals treated by the "blood-letting practitioners." A horse is found to be unwell, dull, a little off his feed, and, perhaps,

giving an occasional cough. On examination, the pulse is found not increased in number, yet the animal, to use a stable term, is evidently "amiss." It is thought the loss of some blood will soon make him all right; four, five, or six quarts are abstracted from his jugular. On the next morning the animal is found worse instead of better; his pulse has increased in number instead of diminished, his breathing is quicker, and he is more uneasy. It is then thought that there has not been sufficient blood taken to arrest the inflammation—that if more had been abstracted the attack would have been cut short; or, as many of the energetically spoken would say, "knocked on the head." Under this impression the horse is again bled, but with no happier result. The symptoms become aggravated; the breathing more laborious; the pulse much quicker, perhaps jerking; great uneasiness is evinced, and it is decided to "take a little more blood." Still the symptoms present no amelioration. The pulsations become more numerous within a given time; the arteries seem to bound beneath the finger; many of them, the small ones in which no pulsation could be found before, now show it most distinctly; the action of the heart becomes throbbing, sometimes tremulous, often irregular; the animal blows like a pair of quickly-worked bellows in his breathing; and although these symptoms are caused by loss of blood, yet there is an increase of temperature; the superficial vessels of the head are turgid, and the mucous membranes within the eyelids and the nose are injected, leading the generality of observers to imagine that the system was suffering from an active inflammatory attack, for which blood-letting was necessary for its subjugation. Such cases either suddenly sink, or the reaction continues increasing until it eventually completely exhausts the vital powers, and the animal falls a victim to the injudicious application of the very means that had been adopted to save him. I have seen in my professional career some thousands of horses sacrificed in this manner, by excessive reaction resulting from loss of blood being mistaken for an inflammatory affection requiring a repetition of blood-letting. Previously to death, in such cases, the animal shows unmistakable symptoms of what is thought to be bronchitis. The air tubes and cells of the lungs fill with mucus, which assists, by its suffocative tendency, in the destruction of life.

Sometimes after blood-letting there is induced a state diametrically opposed to that just described as "excessive reaction." It may, therefore, be called "defective reaction." The pulse, although increased in number, is so feeble that it can scarcely be felt beneath the finger. The beating of the heart is of the same character: they are both sometimes irregular. The animal droops his head, hangs the under-lip, and is cold on the surface, particularly of the ears and limbs. The breathing is oppressed in character, as well as accelerated. The lungs are evidently affected: their air-cells and passages cannot get rid of the mucus that is secreted into them; there is much restlessness and general distress; the fore-legs are held far apart; the gait, if movement is attempted, is tottering: at last the limbs refuse to support the frame, the animal falls, often in attempting to lie down, and, if a horse, quickly dies. Such are the symptoms of an animal's dying from loss of blood, where the reaction has been insufficient for the effectual rallying of the system. It is thus animals die from the effects of blood-letting, when it has been improperly prescribed as a curative measure in those diseases of a depressing nature, as far as regards nervous influence and the general circulation, such as influenza and distemper in horses, typhus in cattle, and most sheep diseases.

Having alluded to the two kinds of reaction following loss of blood which are inimical to life, allusion is necessary to that amount or state of reaction which is the most desirable, and the best calculated for the establishment of health, or the animal's recovery from the effects of loss of blood. In my lectures, at the Royal Dublin Society, I was in the habit of designating it "simple reaction:" of late, however, I regard the term "healthy reaction" as more desirable. I shall, to make it better understood, first consider it as seen in a healthy animal that has been bled to the extent of producing fainting. A description of its phenomena, as observed in cases of disease in the treatment of which blood-letting has been used as a remedy, must be postponed till those maladies come, in due course, under consideration. If the reaction be healthy, after the animal having been bled to the extent of fainting being produced, no peculiar symptoms indicating a deviation from health can be observed, excepting general weak-

ness, particularly of the muscular powers. There is scarcely any increased action of the heart or pulsation of the arteries. The vessels throughout the system quickly adapt their capacities to the diminished quantity of blood within them, and are again gradually distended with the vitalizing and nutrient fluid by the additions to its quantity received from the results of digestion and assimilation, which form blood out of matters apparently least like it, that are received into the stomach as food. Let it not be imagined that it is merely an increase in the quantity of the blood that is required to re-establish a healthy state of the system. The quantity of the nutrient fluid circulating throughout the frame must be brought up to the required standard of nutrient and nerve-stimulating power. Were it not so, the lost balance in the circulating fluid could soon be restored by the animal drinking even water, which would be quickly absorbed, and thus, in some measure, re-establish the balance as to quantity, but not as to quality.

Death from loss of blood may be either immediate or remote—immediate, when with the flowing of the vital fluid ebbs the tide of life, until death takes possession of the frail bark of mortality; remote, when any of the modifications of reaction or sinking intervene between the detraction of blood and the termination of life. It would appear that in dissolution, as in fainting, the brain is the first part the functions of which become deranged. For some time after the brain has ceased to act, it is observed that the beating of the heart and the circulation in the blood-vessels are kept up. In immediate death, consequent on the loss of blood, the first symptoms resemble those of approaching fainting. The animal sighs and becomes restless; the pulse increases in frequency, but diminishes in force; the respiratory movements become hurried, and perspiration exudes from the skin. If the head of the animal be kept in an elevated position he falls to the ground in a state of fainting, which in the horse is of short duration. When down, he struggles violently, the blood still flowing; the limbs quiver; the respiration becomes gasping; the eye is drawn into the orbit, forcing out the haw; and the abdominal muscles contract to expel the air out of the lungs, the last act of life being an expiration.

If, instead of holding the animal's head up while the blood is flowing, he is left at liberty, he staggers about, instinctively holding the head down, and spreading the legs apart from each other to keep himself from falling; but he at last falls with a tremendous force, surviving but a short time when down, and in dying evincing the same train of symptoms as those I have just described when the animal first faints, from the head being kept above the level of his body. There are many instances in which death has been extremely sudden from loss of blood. This most frequently happens when there is internal hemorrhage, or when there has been much blood taken away on a previous occasion. Internal hemorrhage in the horse more frequently results from ruptured liver, consequent on a diseased state of that organ, than from any other cause. Many horses have suddenly dropped dead before even an ounce of blood could be extracted from the jugular vein, which had been opened with a view of alleviating what was thought to be some highly acute inflammatory affection, requiring the detraction of blood.

The discovery of such an accident as ruptured liver cannot well escape those who take the trouble of examining the state of the membrane of the eye and inside nose, and inquiring into the previous history of the case. They are found to be of a yellowish-white colour, very pale. The ears and extremities are cold; the pulse of a very peculiar character, more easily remembered by those who have once observed it than to be described with accuracy, the character of the pulse being judged of by the organ of touch, the sensibility and education of which vary to an amazing extent in different individuals. The perusal of these observations may not be interesting or amusing to the cursory reader, but their study is absolutely necessary to understand that practical portion of the subject.

It is generally thought that where there is greatly increased action of the heart and pulse, in force as well as frequency, the case is one for which blood-letting is desirable. There are, however, many cases presenting those symptoms in which to take blood is but to diminish the chances of recovery. The number of the pulse and of respiration is by no means as infallible a criterion, as to the propriety either of abstracting blood or the contrary, as the generality of persons imagine. The apparently fevered state of the system may depend on cir-

cumstances for the combatting against which blood-letting would be most injudicious. For instance, if a horse is affected with gravel or stone in the bladder, he is likely to occasionally suffer excruciating agony. The entire system sympathizes; the pulse augments in force and frequency, the breathing becomes accelerated, and the animal restless. Blood-letting would but debilitate, and render the frame less able to endure the suffering. It would not even diminish, let alone remove, the exciting cause of the mischief. One of the most familiar examples of great constitutional disturbance being induced, from sympathetic action in the horse, is where there is the formation of matter beneath the horn of the foot, whether resulting from the prick of a shoeing nail, or from some other wound, from a bruise, or from spontaneous suppuration, something like whitlow in the finger of a human being. The accumulating matter is pent up beneath the unyielding horn, causing such intense pain that the circulation and respiration become sympathetically affected, through the medium of the nervous system, presenting symptoms often mistaken for general inflammatory action, requiring blood-letting. In such affections the endurance to loss of blood is diminished, instead of increased.

The primary desideratum in medicine, whether brute or human, is to ascertain the cause of derangement. Too frequently effects are mistaken for, or confounded with, the causes which produce them. To distinguish between cause and effect is the grand keystone to the arch of medical science, and of, in fact, philosophy itself. Certain conditions of organs and tissues, and the circumstances under which they are relatively situated, often produce for their result a peculiar state of the system, very much resembling general inflammatory action, requiring blood-letting; but for which the measure would be injurious. The state of the animal in severe colic from indigestion is a striking example. A quantity of imperfectly digested food accumulates and becomes impacted in the intestines, sometimes in the stomach, causing great abdominal pain; the animal throws himself about his box or stall in agony; the pulse becomes rapid, at first strong and regular, though, as the disease advances, weak and irregular. If relief be not afforded, by getting the stomach and bowels to act and get rid of the offending matter, inflammation of the intestines will certainly set in, and most likely prove fatal. There is no inflammatory action in the first stage, notwithstanding the alarming symptoms of the increased pulse, rapid breathing, and frantic plungings. Bleeding in such cases is injurious. It but debilitates, rendering the constitution unable to hold out through the suffering. Even if absolute inflammation has commenced, it can be of no service unless the cause which has produced it be removed. The indigested accumulated mass within the intestines, the cause of mischief, must be removed, or all other remedies will be fruitless in beneficial effects. Remove the cause, and the effects which so much resemble acute inflammatory action will soon disappear. Of course, if before the removal of the offending indigested mass inflammation has been already established, the proper treatment for inflammation of the bowels must be adopted; but not before the stomach and intestines have been relieved from their obstruction. Much nicety is required in discriminating the difference between such cases and primary inflammation of the bowels. There are some cases of indigestion in many of which the stomach is found distended with a hardly impacted mass of food, just as it had been swallowed, in which derangement of the brain is much the predominating symptom that the affection is frequently mistaken for inflammation or disease of that organ itself, instead of its functions being merely deranged from sympathy with the stomach. Practitioners labouring under this mistake frequently bleed, and direct their treatment to the head, instead of the digestive organs. The result is death.

The treatment should be directed towards the stomach and intestines, with the view of inducing the expulsion of the accumulated mass of impacted food from the stomach through the bowels. Bleeding is most injudicious in such cases. The affection has been called, and not inappropriately, "stomach staggers." The animal at first shows symptoms of uneasiness; he is restless, continually pawing, looking round at his flank, and breathing quickly. The pain increases, he knocks himself about, the respiration becomes blowing, his eyes wild looking, he becomes unconscious, he forces his head blindly forward against rack, manger, wall, or anything before him, as if his object were to push through them; the pupils of his eyes be-

ome dilated, his breathing more prolonged and noisy; sometimes there are sudden starts of violence; at last he falls and dies. On opening him, the stomach is found distended with food nearly to bursting. The brain presents no appearance to account for the symptoms of its derangement evinced before death—symptoms which are too often mistaken for those of inflammation within the head, and treated accordingly, particularly by the abstraction of large quantities of blood; but in which blood-letting but accelerates the fatal termination. This section is frequently met with in grass-feeding horses, used in low draught—sometimes, however, in a different class of animal. Some years ago it caused the death of a most valuable thorough-bred sire in my possession, Cup-bearer. He manged one night to force open the door of his box, and get into his stable-yard, under a shed in which was the bean chest, its lid up. He got at the beans, of which he was very fond. He ate of them till he was satisfied, and having done so, it is resumed he went to the water tank, and drank plentifully. When found in the morning, and put back in his box, he seemed an excellent health and spirits, but in a short time afterwards was seized with colic. He became violent, then unconscious, and showed all those symptoms of derangement of the brain I have already described. I gave the remedies I thought desirable, but with little hope of saving life; for I observed a peculiar state of the tail, which was elevated and quivering, but led me to suspect he had ruptured either the stomach or one of the intestines. My surmise proved to be correct. He died.

On opening him, the stomach was found enormously distended with food, principally beans, and a tear in it nearly six inches in length, admitting some of the food to escape among the bowels into the cavity of the abdomen. When the beans which he had distended his stomach began to swell, from their exposure to the influence of moisture and heat, he became uneasy and pained. The distension of the stomach was so great that the brain became sympathetically deranged in its functions. Eventually the stomach burst; perhaps during one of the animal's desperate struggles, while writhing in the agony of irremediable pain. Even had the stomach not been ruptured, bleeding would, as in all such cases, have been worse than useless.

As in the human-being, teething in young animals, particularly horses, is frequently accompanied by derangements of the system of the most serious description, the symptoms of which are very deceptive, and mistaken for inflammation of a particular organ, often the brain. In some such cases there is much general fever and constitutional disturbance. Not unfrequently mistaken ideas, relative to what the affection really is, leads to blood-lettings being wrongly adopted as a remedy. Frequently when the gum over the tooth is lanced, and a little aperient medicine given, all the urgent symptoms disappear.

The constitutional irritation attending the formation of abscesses, or consequent on injuries, or the lodgment of foreign bodies, as bullets or splinters, is too often mistaken for general inflammatory action of that nature requiring blood-letting. The difficulty of arriving at the real cause of such derangements is sometimes exceedingly great: the suffering animal being unable to describe his sufferings, or point to their locality, is unable to give assistance in determining the nature of the affection. Symptoms, the history of the case, and of the different circumstances connected with it, are the only means of arriving at the truth. It is the duty of persons following veterinary surgery as a vocation to make themselves thoroughly acquainted, practically as well as theoretically, with the physical signs, and their comparison, by which the different causes of suffering in the brute creation can be distinguished from each other. Although the animal is dumb, the language of his suffering frame, as evinced by physical symptoms, if properly understood, is as eloquent, and less capable of deceiving than mere words.

Although general bleeding has an injurious effect in sympathetic irritation, the abstraction of blood from the diseased locality, if it is possible, is generally found to give relief. Thus, if a joint be suffering from inflammation, the result of injury, and that the constitutional symptoms are severe, it is often found that the abstraction of blood from the locality, either by application of leeches to the shaven surface, or by opening one of the veins, is attended by the most beneficial results.

It is sometimes very difficult to draw an exact line of demarcation between the state of constitutional irritation and that of inflammation. One will, under certain circumstances, produce the other. Generally, if the case be thoroughly investigated, the decision as to treatment is easy.

Generally speaking, the existence of inflammatory action increases the extent of endurance to loss of blood; but to a very different extent in different diseases. A knowledge of the different degrees of hemorrhagic endurance is of the greatest importance in veterinary medicine. As to prescribing the loss of blood (as I have already stated) in a measured quantity, it is absurd. Nothing can give a proper indication of how much should be abstracted but the symptoms which are evinced by the animal as the blood flows. Whenever it is necessary to bleed, care should be taken that the animal be placed in the best position for the operation to be effective. It is customary to turn horses round in the stall, with their tails to the manger, and to bleed them in that position. The ground of stalls is generally much higher before than behind, for the purpose of letting the water drain off; consequently, when the animal is bled with his tail towards the manger, his head and forehead are much lower than natural in relation to the rest of his frame. In proportion as the head is held low, so is the difficulty increased of producing the desired effect on the system; and the great object should be to produce the effect on the brain and nervous system, with the loss of as little as possible of the vital fluid.

In what is called "general blood-letting," the animal's fore part should be placed on a surface as much higher than the hinder one as can be borne without inconvenience. The head should be held high, and a large orifice made in the vein, to admit of the blood flowing freely. If a horse is bled under such circumstances, the desired impression, the incipient symptoms of fainting, will be produced much sooner, and with a far less loss of blood, and consequently stamina, than if the patient be bled in the ordinary position. After the operation, in tying the animal up, to prevent his rubbing the aperture in the vein, the head should not be kept high. If it be so, the reaction will be slow—perhaps imperfect. Often horses are severely injured by their fainting and falling down after blood-letting, while their heads are tied up to the rack. I disapprove of the horse's head being tied up in the usual manner after bleeding. If the operation has been properly performed, as far as regards the opening of the vein, and the subsequent closing of it, there is little danger of the horse rubbing it for some hours subsequently. They generally do not commence to rub the neck until it becomes itchy in healing, or that the pin used in stopping the orifice commences to cause inconvenience.

The irritation and severe colicky pains caused by the presence of worms within the bowels are very liable to be mistaken for an inflammatory attack of those organs, and are frequently treated by blood-letting. Certainly, worms occasionally produce such irritation that absolute inflammation of the bowels is induced, and energetic measures are required to arrest its progress; but bleeding will produce no salutary effect. On the contrary, it will only prostrate the vital powers, without subduing the disease; to overcome which, it is necessary to remove its existing cause—the worms. When, by the presence of the parasites, inflammation has been established in the digestive canal, the case becomes so complicated that much judgment is necessary for its judicious treatment. The first object should be to relieve the pain. This is generally effected by opiates; along with which are frequently given, and with most satisfactory results, turpentine, in combination with quick-acting purgatives. Counter-irritation to the surface of the abdomen is in many cases found advantageous; but blood-letting is seldom necessary.

When it is ascertained that a horse has worms, it is generally found that some remedy, either in form of drench or ball, or both, is suggested as a specific. Persons who have not thoroughly investigated the subject do not take into consideration that there are several kinds of worms, and that what will remove one description is totally inefficacious for the removal of another. One thing for certain: frequently there are cases of severe pain and constitutional disturbance, from the presence of worms in the intestines, that are mistaken for acute inflammation of the bowels, and erroneously treated accordingly, particularly with respect to blood-letting.

The class of diseases which best bear the loss of blood, and, consequently, require it the most, are those affecting acutely



the brain and its coverings. When there are symptoms of apoplexy, or that that disease has actually set in, the system can bear, not only with impunity, but also with advantage, a greater loss of blood than would prove fatal in almost any other disease. This should be expected, when we consider the extensive influence of the brain over the entire system, and that the very essence of the affection is a congested or distended state of its vessels with blood. This state of the brain and its membranes must be distinguished from that caused sympathetically by the state of the digestive organs, already described as a result of indigestion, the presence of worms, or the constitutional irritation in the young animal consequent on teething. There is also a peculiar cerebral affection consequent on the balance of the circulation's being lost, as an effect produced by a peculiar disease of the heart, which should not be confounded with the state of the system requiring blood-letting for the alleviation of its symptoms.

In acute inflammation of the membranes covering the brain, and intervening between that organ and the bones of the skull, the amount of blood that can be taken without injury is very great, yet not so great as that required in cases of apoplexy.

In acute inflammation of the eye, a vast degree of hemorrhagic endurance is evinced.

Acute inflammation of the covering of the lungs and the lining membrane of the chest (pleurisy) bears the detracting of a great quantity of blood.

Inflammation of the covering of the intestines and the lining of the abdomen (peritonitis) comes next in order. In fact, the inflammation of all serous membranes, the lining of cavities that do not freely communicate with the external air, bear the loss of great quantities of blood with comparative impunity. Even if the case be one of acute inflammation within the interior of a joint, this law is evident. It is also the same in acute inflammatory action of all the white tissues of the frame, such as surround joints, the sheaths of tendons, the tissues which bind down the muscles, the lining membranes and the

coverings of the heart, and the fibrous structure which forms the sack in which the heart is placed.

There is an affection frequently met with in horses, the although not inflammatory, imperatively requires the abstraction of blood for its relief, and the recovery of the animal. It is what may be designated active congestion of the lungs, from their functions and those of the circulation being overtaxed, when the animal is not in a fit state for rapid and prolonged exertion. A horse in high condition, without previous training or the necessary preparative exercise, is taken out either to the hunting field or for fast work on the road; he is forced to continue the pace longer than his breathing apparatus can act with efficiency; he is pushed beyond his powers. If discouraged, he struggles on against the distress of impending suffocation. If the hunting-field is the scene of his exertions, he totters, and falls from loss of breath. If the road, he is ridden or driven to a "stand-still." He is brought to his stable, the breathing never becomes tranquil; he becomes more distressed. If relief be not afforded, he dies. On opening his lungs are found gorged with blood, their colour dark, and every evidence present of his having died from suffocation, consequent on the blood having ceased to circulate through them. This state of the organs may be called the last extreme of congestion. I regard it as one of true apoplexy of the lungs, for there is rupture of, and extravasation from, the vessels.

Blood-letting, pushed to the fullest extent the animal can bear, his head being held high during the operation, is the only reliable chance of recovery. The lungs, surcharged with blood till their vessels are nearly bursting, must be relieved from the blood that has accumulated within them; and that can only be accomplished by copious blood-letting. The over-taxing of horses in a state of undue plethora, from over-feeding and want of sufficient previous exercise, is the cause of this affection, which, though not at first inflammatory, but merely congestive, from the state of the circulation, requires blood-letting to the greatest extreme to which it can be pushed, if the fluid be abstracted with rapidity.—*Irish Farmers' Gazette*.

## WHEAT VERSUS STOCK AND GRASS.

The following remarks may attract the attention of scientific agriculturists.

I have for well nigh fifty years been intimately and very largely connected with land, and having been constantly called on to adjust the claims and study the interests of landlords and tenants, I have been much assisted in that duty by preserving a record of the prices of farm produce.

In transcribing an abridged extract from this register, I wish to direct your attention to the following facts:—

1st, That during the last forty years the price of oatmeal has averaged 38s. per load, or about 1s. 1½d. the old peck.

2nd, That when meal bore a price of 35s. per load, wheat averaged about 25s. per boll, or 50s. per qr. of 480lbs.

As these facts are borne out by the annexed table (see below), I now request your attention to the great changes in the prices of all farm produce during the last twelve years.

*Beef and mutton* averaged 50s. per cwt. prior to 1850. The ruling price is now from 80s. to 63s. per cwt.

*Ayrshire cheese* for ten years prior to 1852 averaged 8s. 5½d. per tron stone; while for ten years prior to 1862 the tron stone of Ayrshire cheese (I take the prices from the sales of an extensive farmer in this vicinity) averaged 12s. 1d.

*Pork* in 1852 sold at 7s. 8½d. per tron stone; while the average of ten years ending in 1862 was 10s. 9½d. per tron stone.

*Oatmeal* for ten years prior to 1850 (leaving out the two years of the potato famine) averaged 29s. 4d. per load, and for the twelve years ending in 1862 the average price rose to 37s. 9d.

While each and all of the above kinds of farm produce have increased in price, we must turn our attention to the price of wheat, which in our Ayrshire soil is the least remunerative, though by far the most expensive, crop to the farmer.

Ten years prior to 1852 the average price of wheat in this county was 43s. 10d. per qr.

Five years ending in 1857 the price rose to 57s. 9d. per qr.

Five years ending in 1862 it fell to an average of 43s. 8d. per qr.; while the last year it only produced the fair price of 41s. per qr.

Were the causes which have latterly led to a fall in the price of wheat of such a character as to induce us to anticipate their removal, we might wait patiently for the change; but I am morally convinced that we have much more reason to apprehend a continuous fall than any rise in this individual article of farm produce.

As the subject is one of much importance, allow me to explain my reasons in detail.

The last ten years have added enormously to the manufactures of this country; every article required for the consumption of our operatives has risen in price, excepting wheat; and I see no cause to anticipate that the same prices which have lately ruled our markets with regard to all other farm produce will not continue to be available, as it is evident that our manufacturing operatives must be fed; and that no farm produce but wheat can be largely introduced to the injury of our farmers.

Wheat stands very differently, as we not only have extensive supplies from continental Europe, but we are exposed to heavy importations of flour from America.

On this last point it is necessary to keep in view the present position of America.

Formerly, the Americans in the Northern States purchased largely from us, and their remittances were made in *coffee, tobacco, &c.* This system must now likely cease; and while the Northern States will require supplies of both money and manufactures from us, they will pay us in wheat and Indian corn, which are almost the only articles of produce at their command. It is true that we are already exposed to this; but when it is considered that the Western States can supply wheat at Chicago at 4s. to 7s. per qr., it is evident that they will soon find some mode of cheapening the expense of transit to New York or to the place of export. Let us contrast the

American wheat husbandry with ours, and we shall find that, barring the expense of conveyance, we never can compete with their climate and their land in the growth of wheat.

Our farmers cannot grow a crop of wheat under the following expense:—

1st year, green crop.—Farm manure per acre 40 cubic yards, 3s. 6d. . . . .	£7 0 0
Artificial manures and seed, say . . . . .	1 15 0
Ploughing, weeding, &c. . . . .	3 5 0
2nd crop, wheat.—Ploughing, &c. . . . .	1 0 0
Seed wheat and rye-grass . . . . .	1 10 0
Rent for green crop and wheat two years . . . . .	5 0 0
	£19 10 0

Against this our farmers have to place the entire loss of their green crop; and their only source of payment for the past and present years is from 4 to 6 qrs. of wheat at 40s. to 45s.

In contrast to this, the American raises wheat without rent, without green crop, and without any expense of horse work, as his horses are fed and kept without expense. In short, there is much reason to apprehend a still greater fall in the price of wheat; and there is every inducement to farmers to take time by the forelock, when an eminent American author informs us, within the last three years, that the farmers in the Western States were *burning grain in place of fuel*, in consequence of the low prices of wheat and Indian corn.

Ayrshire has long been famed for its dairy and Dunlop cheese; and I would, with great deference, recommend that our farmers should reduce the extent of their ploughing and increase their dairies by a change of husbandry; and I throw out the following proposal for their consideration and adoption:—

1st, Let them retire from wheat husbandry, and restrict their green crop so as merely to supply their milk cows and pigs during winter, and probably fatten off one or two aged sows.

2nd, Let them restrict themselves to a sixth, seventh, or eighth shift rotation (the last being preferable), and I then think that the following system might be profitably followed out.

Let a sixth, seventh, or eighth of a farm be well top-dressed and broken up with a white crop.

Let one-half of this land be green-cropped the following year; and let the other half be top-dressed with 5 cwt. crushed bones per acre, and thereafter sown down with a second white crop.

Let the other half of this field be sown down the third year with a white crop, and thereafter let the whole field lie in pasture till it is again ripe for ploughing in the usual rotation of the farm.

If this plan were followed out with every field, it would ensure good grass after a remunerative crop of oats, and it would relieve a farmer of 40 per cent. of his present expense

of horse labour and manual labour attending his green-crop husbandry.

I throw out these observations with no desire to dictate to our agriculturists, but from a great anxiety for the welfare and prosperity of a class of people on whom this country so much depends.

(Tables referred to above.)

#### OATMEAL AND WHEAT.

Decennial average of Ayrshire Fairs.

Fairs.	Oatmeal.	Wheat per Boll, 240lbs.	
		s. d.	s. d.
1820-1829, inclusive . . . . .	16 11½	1 5	7½
1830-1839, " . . . . .	17 5	1 5	3½
1840-1849, " . . . . .	16 6½	1 3	10½
1850-1859, " . . . . .	17 8	1 4	9½
1860-1862, " . . . . .	18 9	1 2	10 3-5ths

Leaving out 1845 and 1846 (the years of potato famine), the average of the other eight years ending 1849 was 14s. 8d., or 29s. 4d. per load of oatmeal.

#### AYRSHIRE CHEESE. Per Tron Stone.

Year.	Glasgow Bazaar.	Sold in County.		Average County.
		s. d.	s. d.	
1823 to 1829, average, . . . . .	7 7½	7 9		
1830 to 1839, " . . . . .	8 8½	8 8½		
1840 to 1849, " . . . . .	8 7	8 10½		
1849, " . . . . .	—	11 0		
1850, " . . . . .	—	7 6		
1851, " . . . . .	—	7 6		8 4½
1852, " . . . . .	—	7 6		
1853, " . . . . .	—	11 0		
1854, " . . . . .	—	10 0		
1855, " . . . . .	—	12 0		
1856, " . . . . .	—	15 0		
1857, " . . . . .	—	12 6		
1858, " . . . . .	—	11 0		12 0 1-5th
1859, " . . . . .	—	11 0		
1860, " . . . . .	—	14 6		
1861, " . . . . .	—	11 6		
1862, " . . . . .	—	12 0		

#### PORK. Per stone of 24lbs.

Year.	s. d.	Year.	s. d.
1852 . . . . .	7 8½	1858 . . . . .	10 4
1853 . . . . .	10 2 4-5ths	1859 . . . . .	10 3
1854 . . . . .	10 4 2-5ths	1860 . . . . .	12 1½
1855 . . . . .	10 6	1861 . . . . .	10 8½
1856 . . . . .	11 10	1862 . . . . .	9 9½
1857 . . . . .	11 0	1863 . . . . .	10 3

—"G" in the *Scottish Farmer*.

## DRAINING.

The first monthly meeting of the members of the Winfrith Farmers' Club took place on Wednesday, Oct. 4th, at the Black Bear Inn, Wool. Mr. J. A. Damen, president, occupying the chair. It was decided that the repeal of the malt tax should form a prominent feature in the proceedings of the next meeting, the subject on the card being "The harvesting of corn, with the disposal of the crops;" and it was thought advisable, by every possible means, to keep before the public the injustice to which the agricultural interest is subjected by the heavy impost upon one of the chief products of the farm. For this evening's discussion, Mr. Bates, of East Lulworth, had undertaken to introduce the question of draining.

Mr. BATES, after a few preliminary remarks, observed that it might appear somewhat out of place in this dry season, when they were all coveting water; but still it was one which was of vast importance as regarded the proper cultivation and productiveness of the soil. He was afraid it was placed in very poor hands, but he would venture to offer a few remarks on the best mode of contending against the damaging influence of water in agricultural pursuits—water proceeding from water-

bearing strata underground, and also stagnant water lying in ditches and on the surface, to be evaporated and carried away in a cold atmosphere, instead of being passed speedily through the land and made a fertilizer, rather than a hindrance to the operations of nature. It was often found that great damage was done by the evaporation of stagnant water, which was detrimental to healthy vitality. It caused a coldness and dampness in the atmosphere, which was prejudicial both to animal and vegetable life; and as an illustration of this he might mention that even ice was manufactured by evaporation. There was indeed no doubt that in clay districts, where there was no opportunity for the water to pass off underground, but where it was exposed to the action of the sun, it slowly evaporated, and affected the climate for a considerable distance round the locality; for instead of the sun, after it had risen, commencing to warm the earth, it was actually, for a considerable time, making the land colder through evaporation. Hence the importance of carrying away the water from the soil as quickly as possible, without allowing it to be subject to evaporation. It was generally admitted that land full of water

could not properly mature a maximum crop in any season. They all knew how desirable it was to have a nice purling stream running through a farm, and this might be either originated or improved by a good system of drainage. Much might be done in this direction by deepening and straightening ditches, and keeping them clean. He had been used to clay districts before he came into this neighbourhood, and he had often observed in a poor, wet field, that the land was considerably better 10 or 20 feet from a good ditch than it was in the other parts, which was no doubt owing to the carrying off of the water. Speaking of draining generally, and the different descriptions of drains, he had often seen rules laid down for the draining of certain fields; but he had found in practice that it was difficult to lay down any general rule for any field. Draining, to be done properly, must be done in a manner best calculated to meet the case in hand. If they had a stiff, tenacious clay, there could be no question that they must put the drains deeper and nearer together than in other soils. On such land they should never be more than 30 feet apart, nor less than 4 feet deep. One indispensable condition was that the work should be done in dry weather, either in spring or autumn. In this case, instead of having to fill in the drains with wet clay, little better than mud, by being exposed two or three days it got hard, and when thrown in left interstices, which by the action of the water afterwards formed fissures, greatly facilitating the rapid passing away of the surface water; and he had found drains cut in dry weather work immediately after a rainfall, while those cut in wet weather did not frequently work till next day, or scarcely at all, owing to the compactness of the clay over the pipes. This was a most important matter in the draining of clay soils. Where they got into a water-bearing strata, however, such as sand or gravel and such subsoils, he did not hold with carrying the drains quite so deep, as the water in such land would drain a long distance almost horizontally. He had no doubt that drains as often failed from being too deep as too shallow, and *vice versa*. When a draining engineer, or anyone else, had got his main drain cut, then was the time to decide the depth, width, and the inclination of the feeders. He had observed a great deal of draining done in the direct fall of the land. He did not approve of this, because he found that, instead of the water, when it fell, going directly into the soil, it was carried some distance along the surface, and went down on the top of the drain in a sort of perpendicular stream. This was manifestly what they did not want. It was well known that rain-water was a rich fertilizer, and that it was advisable it should pass through the soil directly where it fell. By this means the land was considerably benefited, for in the first place it derived heat from the rain, as water falling from the clouds was of much higher temperature than the atmosphere on the surface of the ground. It was also well known that rain-water contained a considerable quantity of ammonia and nitric acid. He believed it was Liebig, a practical agriculturist, who said rain-water might be considered, to a certain extent, a liquid manure; and that being the case, the more of this water they could pass through the soil and into the drains, without interfering with the operations of agriculture, the better for the land. In addition to this, it carried away injurious substances, such as peroxide of iron and other elements injurious to vegetation; and thus, although in an imperceptible degree, they got a purer soil. In order to facilitate the quick flow of water from the surface, he therefore cut his drains diagonally with the fall of the land, so that it might not have to travel far before getting into some of the drains. He had often found in practice that there was not sufficient care taken in the "bottoming" of the drains, which was very essential to the proper laying of the pipes. Drains were often "bottomed" with a tool wider than the pipes, so that when the ground began to heave one pipe was thrust one way and one another, so partially closing the water way. He had also seen pipes laid with a considerable distance between the joints, or pieces broken off, and a piece of clay put over the aperture. These defects it was obvious must interfere with the proper action of the drains; and it was desirable, both in the interest of the landlord as well as the tenant, that if such expense was gone to as drainage incurred it should be done properly. As to filling in drains, he frequently found different opinions prevail. He had seen it done with a clot from the surface of the land, which he considered not only to be a waste of soil, but injurious to the action of the drain, because the surface soil was

more soluble than the ground below, and it was carried by the currents into the drains, which became foul, and thus frequently stopped up earlier than they otherwise would be. In his opinion there was nothing better on the top of a drain than the hardest and strongest earth they could get; and it should be left on the surface to get partially dry, instead of being put in a sloppy state. Another important consideration was the outfalls, or "empties," as they were here termed by drains. These were very often badly formed, and when once formed quite forgotten. Rabbits sometimes got into the large pipes, and there dying caused stoppages, and the same was the case with rats in the smaller pipes. It was therefore desirable that there should be some sort of grating at the outfalls, and they should have 6 inches, or still better, a foot fall at the mouth; but, above all, be kept constantly clean and open, so that they might not be forgotten. He had frequently known tracks of drainage completely spoiled, owing to the outfalls being stopped up. Well, he would suppose the draining had been properly done and paid for. But that was not all; there was something more to be done after that. There were deep ploughing, deep cultivation, and liberal manuring. After the land had been saturated with water it was naturally poor, and charged with substances not required for the growth of plants, for a its original state it was impossible to keep it properly cleared. In fact, when they got the water off it was like a patient after a severe illness, and required a tonic—something to strengthen it, and get it into condition. This was as important as the drainage. But he frequently found that when large sums had been spent in draining poor soils the farmer thought he had nothing more to do, particularly on pasture land. In such cases there were no clovers in the herbage, and half the grass was nothing but rushes, while the other half was scarcely worth the name. If they turned stock upon land thus impoverished, it was little or no use, unless they fed with artificial; and could they wonder that they did not come round if they did not use some means to encourage the growth of better grasses and the destruction of the rough grass and rushes? This could only be done by manuring in such a way as to improve the herbage so as to carry a greater quantity of stock. Then they might improve the land by the latter means, but they could not when there was nothing to feed upon. With these few remarks he would leave the subject to be discussed by the members present. Very probably he had told them a great deal that they knew before, and he was aware that he had much to learn upon the question; but he hoped to glean some information from the remarks which would naturally follow, and in conclusion he would tender his sincere thanks for the patience with which they had listened to his observations.

Mr. SAUNDERS said he quite agreed as to the advisability of draining clay land in dry weather, if they had a good fall; but if it was rather flat, they would not, under such circumstances, be perfectly sure they had the proper inclinations, unless the men were very particular about the work. He thought they should be careful to have enough water to ensure a perfect run where the land was nearly or quite level. They might lay the pipes in wet weather, and put a little earth till they saw the run was good, leaving the other out a little time to get dry and stiff. Mr. Bates justly remarked that they could not lay down one uniform depth for all kinds of land; and on this he differed with the Government, who would not advance money for such purposes unless they laid the drains at a certain depth. It was no use to go to that depth if they could not get an outfall for the water. He thought it well that they should leave their outfall ditch so that it might be sunk a foot deeper, if necessary, after the drains were put in. He had seen pipes put in where, for the want of this precaution, there was no fall for the water. If they got 6 inches or a foot fall the "empties" would keep themselves clear. He had always found that if he did not drain land quite so deep a good outfall made up considerably for the decrease in depth; and he would rather not drain very deep than spoil the outfall. He did not believe anything paid better than draining where it was necessary, and nothing would make better return for the capital expended. In draining "sidelings," and there was a stratum from which water came, by cutting right down the hill they could carry the water direct from the vein, and then they would be able to put the drains much wider apart than otherwise. On strong land, however, he believed they often erred by putting the drains too wide. He quite agreed as to the necessity of level

treatment after draining. On green land, however, he would soon drain with good channels as with pipes; but then they must guard against rabbits and rats. He had a piece one this way merely by cutting a spit and turning the clots aside down to form a water way, which had lasted 35 or 36 years; but it was rather strong land. But this would not do on arable land, because it might be broken down in ploughing. He was a great advocate for having all what was called "air-rained." (Mr. Bates: Ventilated?) Yes, ventilated; and the additional expense was not more than 20s. an acre. He had a field, a portion of which was air-drained and the other rained in the ordinary manner; but the former always worked out sooner than the latter. It was very easily done; and he left the drains open at the top where there was a ditch, or he put a cross pipe to connect them open at one end, so as to allow free ventilation. He quite coincided in the view that no one field could be drained exactly like another.

Mr. SLY spoke of the difficulty he had experienced in draining boggy land. In such cases it was no use to say they should be one distance apart or another; but they had to find where the water came from, and act accordingly. The Government officer came down, and said they must put the drains so far apart, and that all the works must be straight. There was a bog spring about a foot and a-half or two feet from one of these drains, and it continued running for months after. At last he put in some faggots to make a bed for the pipes, and once he had thus tapped the spring it had answered very well. He found a great difficulty with the red water, which left a rusty deposit in the pipes as soon as it came in contact with the air, and therefore he did not think "air draining" would answer in such cases. It was very advisable to have the land properly drained, and not neglect it afterwards.

Mr. MARKE observed that where they had wet land to contend with, it was no use to talk about high farming or improving the land until the water was carried off. As Mr. Bates had said, a good deep ditch would sometimes tell wonderfully. He had deepened a ditch preparatory to draining at the bottom of a "sideling," and instead of one foot as formerly, he had cut it four feet deep. He could not do the draining at season, and the next he found the land did not require draining for a considerable distance from that ditch, and it was now the driest piece in the whole field. He quite agreed with Mr. Bates as to early draining, even in a dry season; and he thought they would always find sufficient water at the bottom to show what run they wanted. They could not be governed by any set rules in draining; but he thought that in whatever soil it might be, where they found a variation in the strata, there they should put down their pipes. Even in clay land he did not think it advisable to go too deep, but rather a little deeper. It was, however, no use to drain unless they did something afterwards, for then they had the greatest part of the work to do in encouraging not only good grass, but good herbage. On clay soils, after manuring with farm-yard dung, they got a large quantity of coarse grass; but he generally ploughed with a good dressing of lime and earth, which was very good for encouraging the growth of clovers in the herbage. He thought there was a great deal of money wasted in government draining, by the pipes being laid too deep or too far apart; and this involved the tenant in an increased rental for work which was not effective.

Mr. READER said it was an admitted fact that where land was not drained naturally it should be artificially, and the best way was the best way to do it. Mr. Marke did not hold with deep draining on strong land. Now, some few years ago he saw a piece of such land, where some of the drains were laid 4 feet deep, and others only 3 feet; but, after a fall of rain, the former began to run much sooner than the latter, and the land there was much drier than the other part. He supposed it must be owing to the water having a better chance of running sideways into the deep drains than the shallow, the drains being kept open by the action of the water. From his experience he had had with the Government inspector of draining he had no fault to find, for when he had explained the reasons for draining in a certain way he agreed that it could be done. He did not think 4 feet was too deep on moist lands, where they could get a fall. In land that was very wet they must be very careful how they put in their drains; for when the water was drawn off, the soil consolidated, and thus the level was reduced, and it sometimes became necessary to deepen their ditch. He also agreed with Mr.

Bates that they ought to get the bottom of the drain just wide enough to take the pipes, so that they might always remain in their proper position. He did not think there was any necessity for collars except in sandy land, where they always found the greatest difficulty in draining. Some people fancied light land did not want draining, but he had found some that was very wet indeed. He also alluded to what were called "galls" on some of their hills, which did great injury to the crops; and unless they were remedied it was no use to talk about "high farming." Natural drainage was best on all lands, but he believed there was a great deal that might be improved by artificial drainage.

The CHAIRMAN said he thought the longer they could keep the drains open before putting in the pipes the better, either in light or strong land. On heavy land it allowed the clay to bake, and on light land it prevented the pipes becoming filled with silt, by permitting the first flow of water to run off before they were laid. He quite agreed with the observations that had been made respecting the effect of digging a deep ditch, by which means in gravelly land he believed they might drain acres and acres of land. In clay soils, however, perhaps it might have no effect at all. Pipe-draining was all the rage now, but it made a great difference whether they had good pipes or bad ones. He had some put in 20 years ago, and there was great difference between them and some now manufactured. It was therefore highly necessary that those who had the management of drainage works should see that the material they used was of good quality. After a few other remarks Mr. Damsen concluded by proposing a vote of thanks to Mr. Bates.

Mr. SAUNDERS seconded the proposition, which was carried with acclamation.

Mr. BATES, in returning thanks, still held to the importance of draining clay soils in a dry season; and, as to the fall, it could easily be decided by a spirit level, with which a drainer should always be provided. He also thought it desirable to have as few "empties" as possible; then they were more likely to be properly attended to, and there should be some fall between them and the ditch. Mr. Saunders appeared to differ from him as to the direction of drains in sloping land, and advocated direct drains in the direction of the fall to the water-bearing strata. But on clay land the difficulty was to get rid of the surface water. They found very little difficulty in dealing with water-bearing strata on clay land. It might, however, have to be dealt with, and then the best way was to get at it at once. Generally speaking, however, he preferred oblique draining to working at right angles. He recollected that ventilating drainage was greatly in favour a few years ago, but it had gone out of fashion, and he would rather have the pipes a little larger to allow sufficient space for the water to flow without filling them than to have them open at the ends. Mr. SLY had spoken of the accumulations from the red water in the bog, which was very difficult to contend against. The water was charged with iron, and in passing through the drains nitric acid liberated a quantity of iron, which, coming in contact with the air, was oxidized. It could only be dealt with by continued care and attention; but by continually passing the rain-water through the soil it might in time remedy itself. He thought the reason of the deep drains acting sooner than the shallow ones, as noticed by Mr. Reader, was in consequence, as they knew, of water gravitating directly, and there was a greater pressure in the column of water running into the deep drains than in the case of the others. As to the subsequent treatment of the land, he did not think anything was better for an after-dressing than ashes or lime compost for producing a good herbage of clovers, &c. With regard to the remark of the chairman, he might say that he would sooner see a thousand pipes broken up, if they were not good, rather than that they should be put down as drains. Bad pipes were worse than bad labour or bad management in any form.

**HOW TO LEAD ANIMALS.**—Cattle, it is said, of all descriptions, horses, calves, and sheep, may be led by making a slipping noose, and fastening it to the lower jaw, passing the rope (which must be small) around the neck and through the noose on the jaw. It is a very easy way of leading a sheep, one not obliged to go behind and "push." After once pulling, the sheep will follow right along, with no trouble.

## PLOUGHING IN AUSTRALIA.

At the South Australian Agricultural Society's Annual Ploughing Match the judges awarded the first prize plough, presented by Messrs. Tuxford, and £10, to William Hamlin.

There was a fair show of implements. Messrs. Tuxford Brothers and Messrs. Jones Brothers exhibited imported implements, as usual; while Mr. Joseph Mellor evidenced what colonial skill could accomplish. There were no fewer than seventy ploughs shown by Messrs. Tuxford and Jones, so that a wide choice was left to ploughmen and agriculturists as to the implements they might most desire to obtain. There was also a variety of harrows (circular and zigzag), scarifiers, double furrow and multiple ploughs, field gates, sheep hurdles, and other essentials to the agricultural and pastoral farms.

The following entries of implements were made:—

Best Plough—Nos. 1 to 35, Messrs. Tuxford; Nos. 36 to 70, Messrs. Jones.

Best Subsoil Plough—Nos. 1 to 4, Messrs. Tuxford; Nos. 5 and 6, Messrs. Jones Brothers; No. 7, Mr. E. M. Bagot.

Best Harrows—Nos. 1 to 5, Messrs. Tuxford; Nos. 6 to 15, Messrs. Jones Brothers.

Best Scarifier—Nos. 1 to 4, Messrs. Tuxford; Nos. 5 and 6, Messrs. Jones Brothers.

Best Double Furrow Plough—Nos. 1 to 3, Messrs. Tuxford; Nos. 4 to 8, Messrs. Jones, Brothers; No. 9, William Crossman.

Best Multiple plough—No. 1, Messrs. Tuxford; No. 2, Messrs. Jones Brothers; No. 3, Mr. E. M. Bagot (quadruple).

Best Landpresser, Two-wheeled—No. 1, Messrs. Tuxford.

## FARM CROPS AND FIRE INSURANCE.

The frequent fires which take place in stackyards and farmsteadings induce us to direct the attention of our readers to the importance of providing against accidents of this nature through the medium of insurance, which can be so readily effected in all parts of the country. It is true that, in the case of some of those fires which have recently occurred, it was stated that the loss was covered, or partially covered, by insurance; but it is nevertheless true that there are hundreds, we may say thousands, of farmers in the kingdom who never think of insuring their crops, when gathered in the rick-yards, against fire. They may insure the buildings on their farms, being perhaps obliged to do so by the terms of their leases; but their crops, the result in a great measure of all their toil and anxiety throughout the year—that for which they "haste to rise up early, and so late take rest, and eat the bread of carefulness"—are left exposed to the manifold chances by means of which they may speedily be reduced to heaps of ashes. A spark from an engine, a match thrown down by a careless smoker, children at play, or, as it is feared has been the case recently, the work of a cowardly incendiary, may very soon destroy all the fruits of the year's labour, and, it may be, leave the owner a ruined man.

Danger from fire is much greater now than it was at one time. Steam-engines, fixed or locomotive, are common; and the manner in which the latter are sometimes employed in thrashing not unfrequently leads to accident. There is also the almost universal use of lucifer matches to drend; and as these are often carried about loosely in the pocket, it is impossible to guard against accident; nor is it easy, when fire occurs through this means, to trace it to the proper cause, and thus, perhaps, it is attributed to something which had no connexion whatever with the real source of the mischief. As to loss from deliberate incendiarism, let us hope that such cases rarely take place. It is the most cowardly of all crimes—one which cannot be expected to benefit those by whom it is committed in the slightest degree. The gratification of a revengeful disposi-

tion may indeed prompt a man to the commission of this crime; and it no doubt possesses this advantage in the estimation of a sneaking coward, that it can be perpetrated without any immediate risk of personal danger to himself. A penny box of matches is far more than sufficient to destroy thousands of pounds' worth, and a fleet pair of legs soon put the criminal at a safe distance from the scene of his operations.

There are, perhaps, few sights more attractive to one who looks upon such matters with a farmer's eye than a large and well-filled stackyard, with its neatly-built and snugly-thatched ricks ranged in goodly order, and promising abundance of food for man and beast. In some parts of the kingdom the produce of the farm is all secured within one enclosure; while in other places it is scattered over the farm, and ricked often in the fields where it is grown. The latter plan, although inconvenient in some respects, has this advantage, that when fire occurs only a portion of the crop is exposed to danger; whereas, when all is gathered together into one place, the burning of one stack is fraught with danger and almost certain destruction to all, and even to the farm buildings near which the stackyard is usually placed. Dividing the crop, therefore, is on the whole the safer plan; and it strikes us that of late years this has been partially adopted in several cases where formerly it was all secured in one place. This is so far a security against at least total loss, but along with this an insurance ought to be effected in every case. It is not a practice to which only rich men or extensive farmers need have recourse; it is equally open to, and perhaps more required by, the struggling poor man, to whom the loss of a single stack would be a very serious event. Under any circumstances farming is not such a profitable business as to allow those who are engaged in it to run any needless risks. As that experienced authority, Mrs. Poyser, says in "Adam Bede," farming is "raising victual for other folks, and just getting a mouthful for yourself; and your children as you go along. It's toiling and striving, up early and down late, and hardly sleeping a wink when you lie down for thinking as the cheese may swell, or the cows may slip their calf, or the wheat may grow green again if the seed; and after all, at th' end o' the year, it's like as if you'd been cooking a feast and had got the smell of it for your pains. When, therefore, some of the disastrous chances attendant on farming can be mitigated by such a ready, simple, and comparatively inexpensive process as insurance, we think that every prudent man should avail himself of it.

**BREWERS' GRAINS.**—If any corroboration is needed as to the alarming statements in reference to the fearful havoc the cattle plague has made among milch stock in London and suburban dairies, the fact of there being an unprecedented glut of grains without sale at the great London breweries amply testifies as to the great clearance the cattle pest has made in the cowsheds. The invariable custom with the large and other brewers is to let by contract for one year, dating from Michaelmas, the grains produced from the brewings, and hitherto considerable competition has prevailed among the cowkeepers to secure contracts, and very frequently sub-contracts are made at high premiums; but this autumn a most signal and ominous blank exists, and the great brewers are unable to dispose of the wetted malt on any terms or definite period; and several large brewing firms are giving away grains, and even paying to have them cleared away, and unfortunately very many sheds which stabled up from 10 to 60 milch cows each are now entirely empty, and the consumption of grains, which are the *mainstay* of London cowkeeping, is so diminished by the reduction of dairying stock by the pestilence of the contagious cattle disease, that they are hawked about at the London railway goods stations at 6d. per quarter; and country dairy farmers, who now daily transmit by railway large dairies of milk to metropolitan dairymen in their difficulties, are generally adopting them as a "staple commodity." Although this mode of feeding certainly increases the supply of milk, yet it is by no means improved in the quality, and the anticipated great bene-  
Londoners expected to derive by having "pure country milk" imported into the metropolis will be reversed by the reception of "London-made milk" from the country.

## THE CARCASE TRADE, HOME AND FOREIGN.

There are few things more desirable than the immediate completion of that great work now in progress, viz., the change from fat stock to carcase markets, more especially in all our large towns. In the metropolis, the driving of live stock in the overcrowded streets has long been felt an intolerable nuisance, apart from all other sanitary and commercial considerations; but the rapidly increasing growth of towns in the enjoyment of a higher degree of social wealth is giving rise to a demand for animal food in quantity and quality wholly incompatible with the present antiquated live-stock system to supply.

No doubt our consumption of salted provisions, imported from America and other countries, has, at the same time, greatly increased; but the recent advances in sanitary science have thrown a flood of cold water upon the propriety and economy of our hard-working people continuing to live to the extent they have hitherto done on salted animal food; so that any increase of such is beside the question. A generous and regular allowance of fresh animal food of the best quality has become an essential element in the daily necessities of life of the British public. Hence the reason why so large a portion of those at the helm of affairs, who cannot see beyond the routine of the narrow circle in which they move, have shown a degree of sensitive alarm at the proposition of prohibiting the importation of foreign cattle, in order to protect home stock from the cattle plagues of Russia. But all such fidgety fears are premature, and unworthy of the current age; for, under a properly conducted carcase trade, our large towns, and the country generally, can be better supplied with fresh foreign beef and mutton of a far superior quality to that now supplied by the live-stock system.

It will not require a tedious amount of ratiocination to satisfy the intelligent reader of the soundness of the above premises, relative to the increase in question of both the quantity and quality of home and foreign butcher-meat, under an enlightened and properly conducted carcase trade, as the loss of both weight and quality, under the current live-stock system, is incredibly great. No doubt, there is a loss of weight now experienced by those engaged in the carcase trade; and, in the majority of instances, also a heavy depreciation of quality. But the former (loss of weight) is chiefly water; while the latter, under the improvements contemplated, would be reduced to nothing, comparatively speaking: hence the practical conclusion.

Less than half a century ago it would have been a hopeless task to have convinced the bulk of the butchers of the metropolis that they could ever get from the dead-meat markets a supply suitable for their customers. But the fears and prejudices so vociferously expressed by them when the removal of the live-stock market from Smithfield to Islington was first proposed have been since thrown overboard; and now the vast majority visit Newgate-market and Leadenhall-market daily. In point of fact, they could not, at the present day, serve the demands of their customers without daily supplies of "choice bits" from the dead-meat market.

All pictures, it is said, have each two sides; but the commercial one under consideration may not inaptly be said to have four sides—two for the seller or farmer, and two for the buyer or butcher. The latter two, those of the butcher, may be disposed of in a single paragraph; for if we suppose that quality remains upon a footing of equality, butchers can serve their customers better from the dead-meat market than from the live-stock one; for first-class butchers who buy in the latter have for the most part to consign to the former, or sell at home to some neighbour those parts of the carcase not suited to the peculiar tastes of their class of customers. In short, there is a practical defect in the live-stock trade wholly incompatible with the classified wants of the community, so to speak—a defect so manifest in character, and so potent in force, that it is fast undermining the live-stock trade as a system; hence the rapid growth of the nefarious middle-class crafty jobbers, who step in and purchase in the live-stock market, for the carcase trade, so as to enable butchers to get supplies suitable to the

peculiar demands of their respective customers, one class purchasing almost nothing but the best hind quarters, another class chiefly fore quarters, and a third anything saleable they can get for little money. Then there are those who keep cook-shops, and the like, who attend the dead-meat market for their daily supplies. Society is similarly divided, and butchers have no alternative but to go with the times (*i. e.*, the demands of their respective customers), and the times are evidently on the ascending movement on the part of the upper and middle classes of society, who are becoming more particular about the quality and the choice part of the carcase, which they prefer. To such a determination is this preference now being carried, that butchers find it no easy task to retain some of their best customers, who when they see their butcher's stalls loaded with fore quarters, the hind quarters being all sold, or ordered, they at once without ceremony pass on to the next butcher's stall, where nothing but choice parts from the dead-meat market are kept. The practical and professional conclusion is manifest; for no live-stock butcher can enter into competition with carcase butchers, unless he opens at the same time a third-class shop in some of those localities where his fore-quarters and refuse can be sold at a lower price; and even then this alternative is a very problematical one, in a pecuniary sense. In other words, if a first-class butcher can sell four hind-quarters for one fore-quarter, then his business is incompatible with the live-stock trade. The farmer and butcher who cannot see the practical force of this must be professionally blind! It follows therefore that the contemplated improvements in the carcase trade would be an invaluable boon to all classes of butchers, and, we may add, an equal advantage to their customers—all classes of consumers.

Using the above figure of speech once more, it is only the two sides of the farmer's question that we have to examine on the present occasion. Considered as a commercial undertaking, it consists, *first*, in getting fat stock of every kind into the best possible condition for being slaughtered; *secondly*, in the best method of slaughtering, so as to meet the peculiar demands of purchasers; *thirdly*, in the best method of selling or consigning the carcase and the offal; and *fourthly*, in the railway and steamboat conveyance of carcasses, hides, &c. A very cursory review of each of these subdivisions of the work will suffice to show that, as at present carried out, they are all subject to many improvements. In point of fact, candidly and honestly speaking, it is hardly credible that a subdivision of commerce so important to the whole community, both in a sanitary and pecuniary light, as the one under consideration is, should be so neglected in all its multifarious ramifications, and even upheld by the force of habit, as it were, in a state so deplorable as almost to baffle conception; and however much we may feel disposed to blame railway companies and steamboat companies for the little they have hitherto done in forwarding the cause of progress, we cannot, on the other hand, wholly exculpate farmers, either English or foreign, who are manifestly the principal party, or the leading party in the transaction, and who are therefore in duty bound, not only to make a strong pull themselves, but also to apply the whip with becoming fortitude to the tender extremities of railway companies and steamboat companies, in order that all may pull together.

*First:* With regard to the first of these questions, those farmers who have attended to slaughtering are familiar with how much can be done to improve the quality of the carcase by the quality of the food consumed by animals a short time before they are sent to the slaughter-house. There is no fact better established than this—that whether it be beef, mutton, or pork, the quality is always less or more affected by the quality of the food consumed; but with the differences in question, and loss now sustained from a depreciation of the quality of the carcase, farmers are not so familiar, and hence have to learn the benefits they would gain by giving their fat stock a superior quality of food, were it only for a month previous to slaughtering. But we cannot pass from this head of our subject to the next without drawing the reader's attention

to the fact that an improved carcase-trade, as contemplated, involves an improved dietary altogether, for what is good for the fat ox, sheep, or pig, a few days before slaughtering, is just the diet it should have from first to last, and for no other reason than because it is the most economical and profitable to the farmer. Manufacturers who strive to turn out a superior article invariably pay the greatest deference to the quality of the raw materials; and this golden rule the manufacturers of beef and mutton and pork can no longer follow as an exception.

*Secondly:* The indiscriminate slaughtering of all sorts of cattle, healthy and unhealthy, in the same slaughter-house, as now practised in the metropolis and all our other towns, large and small, is highly objectionable. Even when in life, farmers find it advantageous to separate animals that are not thriving from those that are thriving; and the more closely this is attended to, the more successful the results. And when the carcase of the badly-thriving animal is hung up close to that of the healthy one, it always less or more communicates to it some of its own bad qualities. A badly thriving animal is not a negative quality, and very seldom a less degree of vital force, but the presence of some active principle or rather poison in the system, that should not be there, and that active poison remains in the carcase in the vast majority of cases if not in the whole. What that principle may be, is a question which has not been determined up to the present time, some giving it the name of a poison—mineral, animal, or vegetable—others that it has life, animal or vegetable, and so multiplies like some fungi at an overwhelming rate. Most probably all these are right, for carcases sometimes afford ocular proof of vitality both before and after cooking, more especially of the growth of fungi, the whole rapidly becoming green and blue. We are, however, more disposed to take a chemical view of the change that takes place in the majority of cases, a conclusion which is evidently borne out by the rapid manner the carcase begins to smell, and the short time it keeps both before and after it is cooked.

To meet this peculiar feature of the trade practically, there should be first, second, and third-class slaughter-houses and cooling and setting-houses, and carcases thus separated according to quality ought never afterwards to be mixed together. In all other trades the good and bad are kept separate. The most stringent rules, therefore, ought to be laid down and enforced, in order to carry out into practice this salutary rule of subdivision; for until this is done those who produce the best quality of meat will never receive its honest value in the market, while its adoption would soon put an end to the slaughter-

ing and consignment of unwholesome meat to London and other large towns.

*Thirdly:* Under a sanitary view of the subject, nothing, comparatively speaking, requires to be said upon the next head, the disposing of the carcase and offal in the best market. In this case the rule must obviously be left for the experience of the future to determine; the experience of the past being out of date. Were any of the great authorities of the seventeenth century, for example, to rise up from the dead, and to commence talking about their experience to the present generation, they would only create laughter; and not a whit less absurd and ridiculous is the conduct of those farmers and butchers of the present day, who are rushing into print with their experience as a guide for the future. In short, we are advocating for their own individual interests a *new experience for both*, i. e., improvements in the carcase trade, of which neither have any experience at the present time. The case is a very clear one when practically seen and investigated in all its multitudinous details.

*Fourthly:* The proper conveyance of fresh animal food (including not only beef, mutton, and pork, but also dairy produce, fish, fowl, game, &c.), by railway and steamboats, is by far too comprehensive a proposition to be disposed of in a concluding paragraph, or even in a single paper; and, besides, it is a subject that requires to be described by itself. Suffice it to say at present, therefore, that this part of the carcase trade is the farthest behind of any in the march of progress, and the most culpable. An article so perishable in character, so vast in magnitude and value, and of so much importance to the country both in a sanitary and pecuniary sense, ought to be conveyed with greater care than at present, granting that no improvement whatever can be made in the method of conveying. But the present method of conveyance is so antiquated as to merit the most sweeping condemnation that the agricultural press can give it. And it were difficult to say whether railway companies or steamboat companies are the most to blame; for the practice of both is, at the best, an abominable routine, fraught with all the mischief imaginable, as if the practical problem which both companies had for solution was, How best to destroy the meat, generate morbid poisons, and thus sow the seeds of disease amongst consumers? And at the other end, How best to keep down the producer's interest to a minimum? And after carcases have undergone much unnecessary delay in the conveyance, and all sorts of inoculative sausage-making processes, the mode of delivery and marketing in the capital is equally far from what it should be,

## THE CATTLE PLAGUE.

TO THE RIGHT HONOURABLE THE LORDS OF THE PRIVY COUNCIL.

MY LORDS,—Although the subject of my letter is on the structure of the ox, sheep, and other ruminants in relation to the cattle plague, circumstances have occurred since my last communication that are fraught with so much practical importance to the grazier and to the consumer, that I trust that I shall be excused for introducing them. During the last week I have examined the body of a cow, that animal presenting scarcely any signs of indisposition: she was passed at the first examination, but a few hours after this the practised eye of the inspector detected indications of the disease, and he ordered her to be slaughtered. I carefully cut through the whole length of the alimentary tube, and I examined all the other viscera, including the brain; and although scarcely any symptoms were present during life, many organs exhibited unmistakable evidence of this peculiar disease. The first and second stomachs (paunch and honeycomb), as usual, presented to the naked eye internally a healthy appearance, the epithelial covering not peeling off as in the more advanced stages of the disease; and the same remark applies to the third stomach (leafy); but the fourth (digestive) was studded with red circular spots, arising from the loss of the epithelium, and *not from ulceration, as stated by many*. The whole tract of the small and large intestines presented the characteristic congestive markings, with the pap-like matter between them in many

places; the trachea, the large column in the left ventricle of the heart, the endocardial membrane, and the vagina, all exhibited preternatural vascularity and coehymosis. The aggregate glands, so prominent in health, were scarcely perceptible, a condition in which I have always seen them in this disease, and never in an ulcerated state, asserted by many—a fact of great importance when taking into account the chances of recovery and the benefit likely to accrue from medical treatment.

Now, my Lords, the above case clearly shows the insidious nature of the complaint, and that during the period of incubation, when an animal is apparently healthy, latent disease of a formidable nature may be present, that our fairs and markets may abound with cows and oxen in the same state as the one described, infecting all around, and spreading the disease far and wide. The cow in question would have been bought by nine graziers out of ten, without a suspicion being entertained of the presence of the cattle plague. Thousands of animals, I believe, in the same condition are in our fairs and markets, and their flesh is sold for food. And this leads me, my Lords, to a practical and important matter, one that materially concerns the consumers of meat and the health of the people. After keeping a steak, cut from the cow I have described, for two days, I and a favourite cat breakfasted off it, and up to the present time no ill effects have been exhibited. I believe that the meat



in the first stage of this disease is perfectly wholesome (I do not recommend its distribution among the people), and I question whether in the latter stage it would produce any injurious effects upon those eating it; but I hope, by a large series of experiments, to be able to speak more positively upon this subject. The unfortunate death of a veterinary surgeon at Sudbury, Suffolk, I believe, has led to very erroneous inferences respecting the poisonous nature of the cattle murrain, and its effects upon the human subject. I have met with a great many men with cuts and scratches on their hands and fingers, who are daily flaying and cutting up diseased animals affected with cattle plague, but in no instance have I known any injurious effects from it. In this respect the disease forms a remarkable contrast to that of splenic apoplexy, to which I was the first to direct the attention of the profession in this country\* in 1849, and in an essay on this disease published in the "Bath and West of England Journal of Agriculture," 1863, I have given several examples of the injurious effects of this poison upon men, and of the fatal influence of the poison when eaten by pigs, dogs, and ferrets. Mr. Hamilton, one of the commissioners at the late exhibition for New South Wales, told me "that, when this disease was prevalent in that country, the men were so disabled from punctures and the imbibition of the poison, when flaying the sheep, that they refused to work unless they received an amount of pay adequate to the risk." The conclusions I draw from the foregoing are, Firstly, that the cattle plague abounds in our fairs and markets in a latent form, and that in this way the disease is disseminated to a fearful extent; Secondly, that, as far as my researches have gone, the common opinion that the meat of animals dying from cattle plague in the last stage is likely to produce pernicious effects when eaten by man is probably erroneous; Thirdly, that neither the exhalation from the bodies of animals dying of this disease, nor the introduction of the blood or secretions of such animals, by means of cuts and scratches, have, as far as I can ascertain, produced any injurious influence upon human beings; but, notwithstanding this, every precaution should be taken to prevent the ill effects that might arise in cases of cuts and scratches, by the immediate use of salt or spirits of turpentine.

I now come to the more immediate subject of my letter, viz., the structure of the ox, sheep, and other ruminants, in relation to this disease? I shall not touch upon minute and microscopical anatomy, for the accurate description of the intestinal canal of the ox alone would fill a large volume; my object will be to introduce such matters not generally found in books, that are the result of my own observations and dissections; and first, of ruminants generally, and I assume that every animal that chews the cud may be affected with this disease, supposing that the accounts we have from Russia and Germany of the existence of cattle plague in the sheep are correct, but probably the ovine race in this country will not suffer materially from this outbreak. The great length of the alimentary tube of a ruminant is one important feature in its structure, and it is one that has an important relation to this disease. To give your Lordships a correct notion of the extent of this canal in the various species of ruminants, I subjoin a list of some that I have dissected. The extract is made from the "Proceedings of the Zoological Society of London, February 1864," and the measurements were all made by myself:—

	FT.	IN.
Giraffe, old female, 18 years ( <i>C. giraffa</i> ) ...	254	0
" young male ...	209	0
" young, two months ...	107	11
Eland ( <i>O. canna</i> ) ...	161	0
Bubaline antelope ( <i>A. bubalis</i> ) ...	94	6
Old leucoryx ( <i>O. leucoryx</i> ) ...	94	6
Young male do. ...	65	0
Addax ( <i>A. nasomaculata</i> ) ...	73	0
Bontiboe ( <i>A. pygargus</i> ) ...	64	3
Dykertiboe ( <i>C. meryena</i> ) ...	95	0
Rheetiboe ( <i>B. arundinaceus</i> ) ...	48	0
Springboc, young ( <i>G. enchores</i> ) ...	38	0
Sing Sing ( <i>A. kob</i> ) ...	84	0
Gazella vera ...	37	4
Indian antelope ( <i>C. leucartica</i> ) ...	39	0
No. 2 do. ...	44	0

	FT.	IN.
Bennet's gazelle ( <i>G. bennettii</i> ) ...	43	0
Dorcas Gazelle ( <i>G. dorcas</i> ) ...	41	5
" fetus, 16 oz. ...	10	6
Indian antelope ( <i>A. cervicapra</i> ) ...	64	0
" young, a few weeks old ...	33	6
Philancomber antelope ( <i>C. mazwellii</i> ) ...	39	8
Isabelline antelope, young ( <i>A. isabellina</i> ) ...	31	0
Four-horned antelope ( <i>T. quadricornis</i> ) ...	50	10
Harte beest ( <i>B. caama</i> ) ...	83	2
Nylghau ( <i>P. picta</i> ), at birth 14lbs. ...	32	2
" old female 148 ft. 10 in., old male ...	140	0
Rein deer, old female ( <i>C. tarandus</i> ) 120 ft., No. 2 ...	128	0
Mexican deer ( <i>C. mexicanus</i> ) ...	52	6
Malacca deer, young ...	48	4
Sambur deer ( <i>C. austolens</i> ) ...	80	0
Rocky Mountain deer ...	68	0
Virginian ( <i>C. virginianus</i> ) deer, two days old ...	18	2
Musk deer ( <i>M. moschiferus</i> ), weight 15lbs. ...	18	5
Elk ( <i>C. alces</i> ) ...	129	0
Camel ( <i>C. bactrianus</i> ) ...	—	—
Alpaca ( <i>A. pacos</i> ) ...	70	0
Huanaco ( <i>A. huanaco</i> ) ...	95	0
Goat, four months old ...	80	0
Brocket ...	55	9
Mufflon ( <i>O. musmon</i> ) ...	46	7
Aoudad ( <i>G. tragelaphus</i> ) ...	91	0
Cape sheep ( <i>O. aries</i> ) ...	97	7
Southdown lamb, six months old ...	74	9
Old Southdown ewe ...	109	8
Leicester ram ...	117	0
Ox ( <i>B. taurus</i> ) ... 123ft., 136ft., 140ft., and ...	186	0
Bison, old ( <i>B. americanus</i> ) ...	167	0

All the above animals, excepting the *camelidae*, have the same number of stomachs (four) as the ox and sheep; but there is a great difference, as I have shown elsewhere, in the character of the intestinal glands and *sacculi* as in the camels, llamas, and guanachos, the *rumen* (paunch) is smooth, and free from villi; unlike the same part in other ruminants. To give some notion of the capacity of the alimentary canal in a ruminant (and the same will apply to nearly all, if the size of the animal is taken into account), let me quote an extract from my paper on the Anatomy of the Bactrian Camel (*C. bactrianus*).<sup>\*</sup> No one can form a proper notion of the immense size of the camel's stomach unless it is seen distended; when in this state, the following are the measurements and capacities of the various parts: the length of the *oesophagus* 6 feet, of the *rumen* 48 inches, its circumference 5 feet 6 inches, and it holds (including the water bags) twenty gallons of water. The length of the second stomach is 21 inches, and its capacity about six quarts. The third stomach is 34 inches in length, and holds about three gallons of water. The fourth stomach is 18 inches in length, and will contain three quarts of water. The fifth cavity is 9 inches long, and holds about two quarts of water. The capacity of all is about 25 gallons 3 quarts; and the length of all, when distended, is 9 feet 6 inches. As regards the quantity of water that these cavities hold, I cannot pretend to speak with perfect accuracy.

If we take the capacity of these gastric cavities in the ox and sheep, we shall find that, taking size into account, they will be larger than in the camel. The stomachs of a large ox will probably contain 30 gallons of water, but in the ox and sheep we have a more complicated digestive apparatus than in the camel. Let us briefly examine that of the ox: all the stomachs are supplied with villi, folds, and elevations of the membrane, so as to multiply the absorbing surface to an enormous extent. In the paunch, the leaf-like villi in some parts number about 206 to the square inch. Along the whole course of the alimentary tube we have longitudinal and transverse folds, so as greatly to increase the superficies; and, in addition to these, we have in the ox, besides millions of villi, long and numerous aggregate glands. In a healthy bull, that I have recently dissected, the total length of these glands was 18 feet, and they varied in width from one-third to one inch in width; but as I have remarked before, in cattle plague these glands, probably from want of use for the first and third stomachs, are generally blocked up with vegetable

\* "On the Structure and Use of the Spleen (out of print)."

\* "Proceedings Zoological Society of London, March 1865."

matter. Fancy, my Lords, the influence a millionth of grain of arsenic must exert amongst a hundred-weight of dry vegetable food! And it is this stoppage in the first digestive cavities—this paralysis, it may be, of the very fountain of nutrition, that leads to the difficulty of treating this disease, as I hope to show in my next letter. There is nothing in any other structure of the ox, that I know of, that materially concerns this inquiry, except the tongue, which as is well-known, is furnished with spines, as in the lion, and in many carnivora, probably to enable the animal better to take the coarse grass, to which it often gives a preference.

I have stated that the alimentary tube of the ox varies in length from 120 to 180 feet, that of the sheep from 70 to 117, but the great difference in the digestive apparatus of the ox and sheep is the absence of spines on the tongue of the latter,

and the less complicated glandular structure of the alimentary tube. The foldings and doublings in the intestines of the ox are scarcely seen in the sheep, and the aggregate gland in the latter animal are comparatively of small extent and less elevated. In the intestinal tube of a lamb now before me, I find that these glandular patches amount to ten, each about three inches in length, and about one-third of an inch in width. These differences, however, scarcely serve to explain the comparative exemption of the sheep from this disease.

In my next letter, my Lords, I hope to describe the pathology of this "Cattle Plague."

I have the honour to be, my Lords,

Your obedient servant,

EDWARDS CRISP, M.D.

42, Beaufort-street, Chelsea, Oct. 7, 1865.

## CALENDAR OF AGRICULTURE.

Finish the sowing of wheat, if any remains undone from last month. Take up Swedish turnips, and store the roots at the homestead, and give the tops and small bulbs to the sheep in the fields, or to young cattle in the yards.

Flood water-meadows. Clean out and put in to proper order the main channels, conveying-gutters, and the sluices of floodgates.

Begin to cut underwoods, plant forest-trees, open-drain plantations, repair old fences and make new ones, cast-open ditches, and repair roads.

Thrash grains once or twice in a week regularly, to supply the beasts with provender and the yards with litter. Sell and deliver all grains as thrashed. Cut hay and straw into chaff, mixed for horses, the fattening bullocks at the stake, and for being steamed for the milch cows. Apply all litters thinly and evenly over the yards, and spread over the surface all different substances for the purpose of being mixed.

Supply to the cattle in the yards by break of day an ample feed of turnips, rooted and topped for the fatting beasts, and with the tops attached for the other sorts of cattle. Wooden cribs with latticed bottoms allow the escape of filth and

water. The turnips being all eaten up by night, the choking of animals unseen is prevented. Give to milch cows cabbages and beet, and one feed daily of steamed meals.

Continue the feeding of sheep, as directed last month, folded on the bare ground over night, or allowed to run back for shelter.

Feed pigs as directed last month; give ample littering, and keep the animals dry and warm. Feed poultry with light grains, and with steamed potatoes and meals mixed, and given in troughs placed in shelter-sheds in the poultry yard.

Attend to the feeding of young horses in the farm-yard. Supply fresh water in a trough, and a convenient and dry shelter-shed. Give hay and straw in chaff, bran, and oats, and a daily feed of raw or steamed roots. The first winter's keep is the chief agent in making superior animals of every kind.

Begin to plough stubbles for next year's fallows, and prepare by fallowing, as long as the weather permits, the land required for the earliest green crops, as potatoes, beet, and ruta-baga, which are very much forwarded by the autumnal preparation of the land.

## CALENDAR OF GARDENING.

### KITCHEN GARDEN.

Artichokes: Protect the plants by mulch or masses of leaves, after removing all the old stalks and decayed foliage. Dig roots for a temporary supply of the so-called Jerusalem artichokes. Store all the potatoes, carefully observing the condition as to soundness or decay. Keep the store very dry.

Broccoli and cauliflower in the open ground should be laid down, and be guarded with a covering of dry earth, laid close over the stems.

Carrots: Dig and store; also beetroot and some parsnip.

Celery: Finish earthing; if frost threatens, cover the ridges and tops with dry haulm.

Endive: Tie up some plants, and remove others to dry frames, for bleaching.

Lettuces in frame, give air to occasionally. Do the same by radish and salads.

### FRUIT DEPARTMENT.

In mild weather, spur-pruning of apple and pear

trees or espaliers is now performed; wall-trees and berry-bearing shrubs are sufficiently early in February. Raspberries are tied by fillis-cord stakes, six rods to each, stopping at an angle towards the North, or to a neat open trellis. The cluster of canes must be open to the sun: perpendicular tying crowds the bundle to stakes.

### FLOWER GARDEN.

Plant tulips, hyacinths, jonquils, &c., in rich sandy beds. Place the bulbs in holes two inches deep, among some sand, and to touch the bulbs all round, and at the base. Move herbaceous plants; roughly fork the surface of beds, and scatter over the surface a covering of old dung of cattle and decayed leaf-mould.

Observe neatness and order everywhere. Any pits, frames, and similar erections must be kept dry for semi-hardy plants, and aired frequently. Dry sun-dust is a fine material to plunge in, as it guards the mould effectually.

## AGRICULTURAL REPORTS.

## GENERAL AGRICULTURAL REPORT FOR OCTOBER.

Somewhat heavy rains having fallen in most parts of the United Kingdom, the progress of outdoor farm labours has been interrupted. However, in most of the leading districts they are seasonably forward. The pastures have continued full of grass; but the supplies of stock in them have been considerably less than in many previous years. Fortunately for the breeders and feeders of both beasts and sheep, ample quantities of food have been secured for winter consumption. At a period like the present, when meat is unusually high in price, notwithstanding the immense importations from the Continent, an adequate supply of food is a most essential element, as we may now pretty safely calculate upon a great improvement in the quality and condition of all kinds of stock exhibited for sale during the winter months.

Although the present year's crop of wheat has turned out well as to quantity, the demand for that description of produce, both home and foreign, has ruled steady, at an advance in the quotations of from 1s. to 2s. per quarter. Barley, oats, beans, and peas, as well as flour, have tended upwards in price, with a good consumptive inquiry. The probability is that we shall see fine wheats from 4s. to 5s. per quarter higher than they now are, owing to the great falling off in the importations from the United States, in which country prices are much too high to admit of profitable shipments to England. There appears to be a scarcity of really fine English barley in the hands of our farmers. As a whole, however, the yield is nearly equal to last season.

Throughout the Continent, wheat is gradually advancing in price, with an increased demand on English account. Barley and all other articles have shown a hardening tendency. The supplies of wheat and maize on passage from the Black Sea ports are small when compared with the corresponding period last year; but those from the Baltic, as regards wheat only, are moderately extensive.

Accounts from some parts of England state that the potato disease has made its appearance to some extent. Our impression is, however, that the losses will not exceed the average of years, and that the bulk of the crop will keep well during the winter. The various markets have been well supplied, and a good business has been passing, at from 40s. to 100s. per ton. The imports from the Continent have, this season, been on a very moderate scale.

The growth of hops has turned out a full average, both as to quantity and quality. There has been a good business doing, at from 105s. to 190s. per cwt. Some large parcels of hops of the present year's growth have arrived from the continent. The produce in Germany, as well as in America, appears to have been very large. Still, prices are expected to be steadily supported for some time.

There has been only a moderate demand for all kinds of wool in the Metropolis; but, in the manufacturing districts, large quantities have been worked up to meet the great demand for woollen goods on American account. In prices we have no quotable change to notice. The supply of colonial wool now on hand for the next public sales is about 65,000 bales. The export trade in wool has received a check from the high range of money in the discount market.

The supplies of hay and straw on offer have been only moderate. The demand has fallen off, and prices have had a downward tendency. Meadow-hay is selling at from £4 4s. to £5 10s.; clover, £5 5s. to £6 12s.; and straw £1 6s. to £1 15s. per load. The quantity of hay on hand is certainly in excess of last season.

The beet and mangold crops are unusually heavy, and of fine quality. The growth of turnips, however, is a partial failure.

In Scotland the corn trade has shown signs of animation. Wheat, barley, and oats of fine quality have produced rather more money, and the value of all other kinds of grain has been well supported. The shipments to the south have been on a very moderate scale. The growth of wheat has turned out much better than was at one time anticipated.

The Irish markets have been scantily supplied with wheat,

for which the demand has ruled steady, at about 1s. per qr. more money. Barley and oats have sold on rather higher terms; but other articles have met a dull inquiry. Some large parcels of grain, especially barley and oats, have been taken for export to England.

## REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

Although the demand for beasts in the Metropolitan Market has been somewhat less active than in the previous week, prices have again ruled very high. The importations from the continent have been very large, but chiefly in middling condition; consequently prime stock has changed hands freely, at full quotations: otherwise the trade has been in a sluggish state, on former terms. The weight and quality of the arrivals from our own grazing districts have somewhat improved; nevertheless, really prime stock has continued scarce from that quarter.

Notwithstanding the high rates which have prevailed, the best Downs and half-breds having realised 6s. 8d. per 8lbs., the supplies of English sheep have been again limited. From abroad, however, the arrivals have been very extensive. Selected breeds have been very firm; but inferior sheep have moved off slowly, at about stationary prices.

There has been a steady, but by no means active, inquiry for calves, at full quotations. Nearly the whole of the supplies have been composed of foreigners. The rates have ranged from 4s. 4d. to 5s. 6d. per 8lbs.

Unusually high quotations have been realised for pigs, the best small porkers having produced 6s. 10d. per 8lbs., with a steady inquiry. The scarcity of hams and bacon in most parts of the country has had considerable influence upon the pork trade. Some really good pigs have been imported from France and Holland.

The accounts from most parts of the agricultural districts in reference to the disease amongst cattle are rather more favourable; nevertheless, much alarm continues to be felt amongst the owners of stock, who have suffered severe losses of late.

The supply of food now on hand for winter consumption is considerably in excess of last year. Hay, however, though somewhat lower in price, is still selling at high quotations.

The imports of foreign stock into London during the month have been as under:—

	HEAD.			
Beasts	...	...	...	16,344
Sheep	...	...	...	69,611
Lambs	...	...	...	1,758
Calves	...	...	...	1,952
Pigs	...	...	...	9,135
Total	...	...	...	98,800

COMPARISON OF IMPORTS.				
October.	Beasts.	Sheep.	Calves.	Pigs.
1884	16,074	38,715	3,339	5,537
1883	11,660	37,521	1,129	3,965
1882	7,906	28,109	1,327	1,600
1881	5,577	42,538	1,207	5,315
1880	6,750	24,980	1,662	2,074
1879	6,023	24,323	784	878
1878	4,600	24,145	1,581	553
1877	5,819	24,102	1,993	1,233
1876	8,871	10,502	1,280	895
1875	8,136	21,137	1,358	1,501
1874	6,894	16,328	1,009	1,063

The total supplies of stock exhibited in the Metropolitan Cattle Market have been as follows:—

	HEAD.			
Beasts	...	...	...	30,210
Cows	...	...	...	132
Sheep	...	...	...	157,840
Calves	...	...	...	2,932
Pigs	...	...	...	2,478

## COMPARISON OF SUPPLIES.

October.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1884 .....	33,840	519	137,424	2,671	3,820
1883 .....	30,512	535	110,800	2,029	3,439
1882 .....	28,972	526	118,780	1,855	3,386
1881 .....	28,320	539	121,390	1,626	3,650
1880 .....	26,240	525	128,250	2,289	2,620

The supplies of English, Scotch, and Irish beasts thus compare with the three previous years:—

	Oct., 1882.	1883.	1884.	1885.
From Lincolnshire, Leicestershire, & Northamptonshire	13,800	11,660	10,600	8,450
Other parts of England.....	3,000	3,650	3,500	3,700
Scotland .....	18	28	123	53
Ireland .....	3,400	2,780	2,070	990

Beef has changed hands at from 3s. 4d. to 5s. 4d.; mutton, 4s. 4d. to 6s. 8d.; veal, 4s. 4d. to 5s. 6d.; pork, 4s. 4d. to 5s. 10d. per 8lbs., to sink the offal.

## COMPARISON OF PRICES.

	Oct., 1881.			Oct., 1882.		
	s.	d.	s.	s.	d.	s.
Beef from .....	3	10	5	3	0	4
Mutton.....	3	0	5	3	6	5
Veal .....	3	6	5	3	10	5
Pork .....	4	0	5	4	0	5

	Oct., 1883.			Oct., 1884.		
	s.	d.	s.	s.	d.	s.
Beef from .....	3	4	5	3	2	5
Mutton.....	3	6	5	3	8	5
Veal .....	3	4	4	4	0	5
Pork .....	3	4	4	3	6	4

The tallow market has become in an excited state, and prices have advanced, although the shipments from St. Petersburg show a large increase, compared with several former years. Rough fat has risen to 2s. 7d. per 8lbs.

The supplies of meat on offer in Newgate and Leadenhall have been moderately good, and the trade has ruled steady. Beef has sold at from 3s. to 4s. 8d.; mutton, 4s. 4d. to 6s.; veal, 4s. 4d. to 5s. 4d.; and pork, 4s. 2d. to 6s. per 8lbs. by the carcass.

AGRICULTURAL INTELLIGENCE,  
FAIRS, &c.

**AXMINSTER FAIR.**—Stock was in less supply than usual. Fat beef from 11s. to 13s. a score; heifers and calves sold well at from £12 to £16; fresh barrenners from 5s. 6d. to 7s. a score, two and three-year-old heifers £8 to £10, one and two-year-old heifers £5 to £8, two and three-year-old bulls £6 to £9. The sheep fair was well supplied, nearly 4,000 penned. Prices being lower than they have lately been, business was rather slack. Fat sheep from 8d. to 9d. a lb.; horn ewes from 40s. to 54s. each; down, horn, and cross-bred wethers from 40s. to 56s.; horn lambs from 25s. to 38s. each; down and cross-bred lambs of various ages from 25s. to 40s.

**BAKEWELL FAIR.**—A large show of both fat and store cattle, for which prices were rather lower. Milch cows and cows down calving were much inquired for, and sold at remunerative prices. There was a large quantity of sheep; fat sheep we quote same in value, stores rather lower. Fat lambs sold at good prices, stores rather cheaper. The supply of store pigs was moderate, and found purchasers at good prices; fat pigs scarce and dear. Good useful cart and waggon horses found customers at good quotations.

**BOSTON FAT STOCK MARKET.**—The supply of fat sheep, though somewhat larger than last week, was still below the average. Sales were readily effected at 9d. per lb. Store sheep were not so plentiful as last week, and trade was slow at recent rates.

**BRIDPORT FAIR** was one of the smallest ever seen. The few good things exhibited moved off tardily; beef 11s. to 12s., store sheep 38s. to 45s., mutton 8½d. to 9d. Some fat ewes sold by auction brought 45s. to 50s.

**CAISTOR FAIR.**—Some lambs made over 50s., and young tupping ewes and gimmers sold readily at prices ranging between 60s. and 70s. The gimmers of small frame and low in condition, with tolerable skins, were good to sell at 54s. to 56s. a head. Mr. Calthrop sold by auction 300 ewes and gimmers

belonging to E. Davey, Esq., of Thoresway, at prices averaging about 70s.; and a choice pen of 10 were knocked down at 98s. per head. The horses shown were chiefly those of the agricultural class, and only little business appeared to be transacted. The beast fair was thinly supplied, the better class of cattle being most in demand. Useful lots fetched high prices, and a clearance was effected early. In-calf and fat beasts were scarce and dear. William Torr, Esq., of Aylesby, showed 10 splendid bullocks, which realised fully 1s. per stone.

**CARLISLE FAIR (Saturday last).**—The fair of the cattle plague has brought about a change. Instead of the Bands being crowded with cattle, as in some former years, there were very few home-bred animals exhibited, a few hundred Irish beasts constituting the bulk of the stock. Business was exceedingly dull. Irish sold at about late rates. Short-horn bullocks were offered at £14, Galloways about the same, and West Highlanders at £6 10s. to £7. The show of sheep was not large, as compared with former years, but a good business was done, especially among Cheviot ewes. Cheviot ewes 32s. to 35s. each, black-faced ewes 18s. to 24s., Cheviot lambs 14s. to 18s., half-bred lambs 26s. to 35s., gray-faced lambs 9s. to 28s. each.

**ELLESMERE FAIR** was small as regards cattle. Notwithstanding the prevalence of the cattle plague, most of the animals found purchasers. Pigs were plentiful.

**FARNSFIELD FAIR.**—Sheep fetched high prices, and considering all things the fair was regarded as a good one.

**GRANTHAM FAT STOCK MARKET.**—A fair show of beasts, but the supply of sheep was small. Trade was dull, sheep being perhaps a little dearer. Buyers refused to give the high prices asked, and many lots went away unsold. Beef 8s. 6d. to 8s. 9d. per stone; sheep 8½d. to 9d. per lb.

**GRIMSBY STOCK MARKET.**—Poor attendance. The price of meat was fully sustained at high rates. Pork in demand; 8s. per stone freely given for store pigs.

**HEREFORD FAIR.**—Quietude reigned in our streets until nearly midday; and the absence of cattle, with their incessant lowing and the hallooing of their attendants, precluded the possibility of even a very vivid imagination realising the idea of its being the great Hereford October fair. Such, however, it was, held under conditions which it is to be fervently hoped will never again be forced upon us. From inquiries which we made from many of our agricultural friends, we are satisfied that the order of the Mayor for the exclusion of cattle met with very general approval. The sheep fair was very well supplied, but a large number of the animals had evidently been sent here by dealers. There were indeed comparatively few farmers' sheep, and as there were scarcely any buyers present the trade was very dull, with a slight downward tendency for very fat things—the best class ewes and wethers with difficulty realising the respective prices of 8½d. and 9d. per lb. Trade in stores, which constituted the great bulk of the animals penned, was languid in the extreme, and many lots remained unsold. The horse fair was a small one, and comprised, as usual, animals of a very miscellaneous character. A few good horses, both for hackney and draught uses, sold well, as did cart snuckers, of which the number was large, and which averaged from £8 to £10, higher figures being obtained for some of "A 1" character. The trade, though dull, was on the whole better than it has been at recent fairs. In the pig department trade was reported to be somewhat easier, but the prices asked were still very high, scarcely anything much bigger than a robust "roaster" being obtainable under a couple of sovereigns; while for stores coming in at all within the definition of useful, £3 and £4 were asked. For a dozen very strong and well-bred stores, in condition, the sum of £50 was demanded. Fat pigs, of which there were few penned, realized 7s. per stone of 12lbs.

**ILSLEY MARKET.**—There was a very small supply of sheep; but the trade was heavy, and to effect sales a reduction of 1s. the head from the prices of last market had to be accepted. Wethers made 50s. to 63s., ewes 48s. to 58s., lambs 82s. to 51s.

**KNARESBRO' FAIR.**—There was a moderate show of fat beasts, prices being rather lower, and not many buyers at 4s. to 5s. 6d. per stone. The show of sheep on Thursday was unusually large, prices having a downward tendency, averaging 8d. to 8½d. per lb., and plenty of buyers. Fat pigs 6s. 6d. to 10s. per stone. Fat calves 8d. to 8½d. per lb. The Knarebro'

fortnight cattle markets are to be discontinued for two months, the Justices having issued an order to that effect at the Petty Sessions on Wednesday.

**LINCOLN FORTNIGHTLY MARKET.**—There was a tolerably good show of fat beasts. The inquiry was slow at a very little change from late rates. For sheep the demand was also quiet. Beef 7s. 9d. to 8s. 9d. per stone; mutton 8d. to 9d. per lb.

**LLANGOLLEN FAIR.**—The attendance was good; a great number of cattle, but few purchasers. Horses, as usual, low. Stores and sucking pigs sold well.

**MAIDSTONE FAIR.**—A good show of horses, many of which were sold. Handsome nags, for private harness, 40gs. to 50gs., riding ditto 25gs. to 40gs., cart horses 35gs. to 40gs., cart colts 22gs. to 30gs.

**NEWBURY FAT CATTLE MARKET.**—A very good supply of beasts, which sold at from 5s. 6d. to 6s. per stone; sheep at 5s. 6d. per stone. There was an average number of store pigs, and prices rather lower.

**NORTH TAWTON FAIR.**—There was not a large supply of bullocks, sale small. Everybody seemed afraid of the rinderpest, but no cases have been heard of in this district. There was a fair supply of sheep; business dull.

**NORWICH FAIR.**—There were fewer cattle than was ever known; the fear of disease has caused graziers and dealers to be more cautious than ever. A drove of prime Galloway Scots, in number near 200, were sold at from 6s. to 6s. 6d. per stone when fat. We are enabled to state every one of this drove appeared in the most sound and healthy state. On the fair stand not a single beast was offered; perhaps this may turn out a finish of one of the longest standing fairs in Norfolk. Fresh cases of the disease keep breaking out in the neighbourhood, which of course greatly injures the trade, and wholly prevents many from purchasing at either fairs or markets.

**PARTNEY FAIR.**—The show of sheep was smaller than usual, and business was rather slow; but prices were sustained, and nearly all were disposed of. One lot of lambs made 59s. Ewes for grazing and all useful store sheep sold well. The flock of Mr. Wright, of Aswardby, was sold by Mr. John Willson, in lots, and good prices were realised.

**PENRITH FORTNIGHTLY MARKET.**—The show of sheep was about 2,170 head. A considerable proportion were ewes and tups low in condition. Good samples were eagerly inquired after, and these realised prices quite as high as ruled at last market. Thirty beasts were on offer; but they were a complete drag, dealers and others, deterred no doubt by the fear of the cattle plague, declining to invest at present in this class of stock. The few that found purchasers brought from 7s. 6d. to 8s. per stone; the rates for sheep being from 7d. to 8d. per lb.

**ROSS FAIR.**—The supply of stock was small, and the prices lower than those realised at our markets up to the present time, but firm on the monthly market held last week. Mutton was worth about 9d., and beef 7½d. per lb. Store sheep sold tolerably well; store cattle a drag. There appeared to be a little more animation in the trade for young horses, many changing hands at a decided improvement on the late low prices.

**SHERBORNE PACK FAIR.**—The supply of sheep was at least 3,000 less than last year (which was also a small fair), and business being transacted with the distrust which the cattle plague has so generally excited. There were a few good fat beasts, which were at once sold, but not at high prices, the best not touching 11s. 6d. The poor stock and a few very small Devon steers were entirely neglected. In the sheep fair some of the best things sold, but others hung on hand. Mr. John B. Crocker obtained 60s. a-head for some fine fat wethers, and Mr. W. Crocker sold the best pair of lambs in the fair at 44s. We quote ewes from 40s. to 42s.; trade nervous and dull at first, but somewhat better at its close, when lots of sheep bought in the morning were resold at a profit of 3s. a-head. There were a few good cart colts: some of the best brought £32.

**SHIPTON-ON-STOUR FAIR.**—There was no fat stock, and only a few barren beasts, which realised from £16 to £18 per head. The supply of sheep was good, tegs realised from 45s. to 48s. per head. Mutton (wether) 9d. per lb. Ewes 9d. per lb. Store pigs, quarter-old from 25s. to 30s. each. Bacon pigs and bacon hogs were quoted at 12s. per score.

**SLEAFORD STOCK MARKET.**—The demand for fat

beasts fair, at 8s. 6d. to 9s. 3d. per stone. Calves scarce and very dear. Sheep 8d. to 9d. per lb.

**THORNE FAIR.**—Very few beasts, and little business, although in one or two quarters heavy prices were quoted. The horse fair, considering the weather, was as well as could be expected, and some good useful Irish ponies met with a tolerable sale.

**THRAPSTON FAIR.**—There was a fair supply of stock, and we do not hear that the present insecure state of things raised any depressive influence on transactions in that line, heavy prices being asked and realized.

**WELLINGBOROUGH FAT STOCK MARKET.**—A fair supply of fat stock. Prices not quite so high as last week.

**IRISH FAIRS.**—**BALLINABLOE:** The sheep fair commenced on Wednesday morning; but a large business was done the day before, and intending purchasers that waited till Wednesday were not a little disappointed to find themselves not only forestalled, but having to pay several shillings per head over those obtained the preceding evening. It is estimated that prices averaged 8s. to 12s. a head over last year's rates for top lots. On Thursday cattle were but in slow demand, and young ones, particularly weanling calves, were all but a drag in comparison to the demand of past years, so that those who had courage to invest in this description of stock must realise considerable profits next season; and it is to be feared "beef" will rate enormously high. Mr. John Ogle, of Lysterfield, sold 100 wethers at £3, and 100 ditto at £3 16s. 8d. Mr. Harry T. Potts, sold 100 wethers at 66s. Mr. D. Lynch, county Rosecommon, sold rams to the following: The Hon. Mr. Campbell, one at £20 10s.; Mr. Egan, £14; Mr. Delaney, £15; Mr. O'Rourke, £14; Mr. Evans, £16; Mr. Lestrange, £12 10s.; Mr. Halladay, £14 5s.; Mr. Richard Kirwan, £16 10s.; Mr. Ward, £13 10s.; Mr. Eyre, £14 5s.; Mr. P. Ryan, £16; and two to Mr. Thong, at £26. He also sold a first-class hunter, by Tom Steele, to Mr. Garnett, at £80. Mr. Petres sold 20 ewe hoggets at £4 15s. to Mr. Richard Walker, and 50 ewe hoggets at £2 12s. A large number of Rosecommon rams were sold at prices varying from £14 to £20. Mr. Littleboy bought 100 wethers at 70s. Mr. Patrick O'Connor, of Dundermott, sold a lot of ewes at £3 17s. 6d. Mr. H. B. Mahon, of Bellville, sold a top lot of ewe hoggets at £3 5s. Mr. Skerret, of Rathfarnham, sold 100 ewes at £4. Mr. R. O'Brien bought 1,000 wethers at prices ranging from 50s. to £3 10s. Mr. Barry, of the firm of O'Brien and Co., bought 800 to 1,000 sheep at prices varying from 55s. to £3 10s., &c. Mr. John Ogle sold 20 small heifers at £11 15s. The following is the official return of the sheep sold and unsold during the last seven years, showing the progress of the fair:

Year.	Sold.	Unsold.	Total.
1859	73,761	20,889	94,650
1860	76,386	5,275	81,661
1861	70,831	4,287	75,118
1862	57,752	14,245	71,997
1863	53,954	19,540	73,494
1864	66,324	8,525	69,849
1865	63,103	1,772	64,875

Horses were in brisk demand. Captain Seymour's horse, sold yesterday to Mr. McGrane at 300 guineas, was again disposed of to-day to Sir Watkins Williams Wynn at a considerable advance. Mr. Purdon, of the *Farmer's Gazette*, sold a colt at £120, and refused £150 for another. Mr. Browne, of Stephen's-green, bought a weight-carrying hunter at £120. Mr. Dunne, of Kildare, sold a horse at 100 guineas, and another at £75. Mr. Denis Kelly, of Galway, sold two colts at £103, and another at £109. Mr. Lauder, of the county Leitrim, sold a very handsome chestnut hunter for £150.—**KELLS:** Best beef 7d. per lb.; second class 6d.; inferior 5d. per lb. Lots of heifers, fully finished, £17 to £21 each. Three year old store cattle from £13 to £16 10s. each, according to merit; two-year-olds from £9s to £12; and yearlings and stirks from £5 to £8 10s.; and for those advanced in condition £9 to £10 each for forward stirks; two and a half year old store bullocks realised excellent prices, from £9 15s. to £14 10s. each; yearlings heifers picked up with avidity from £4 10s. to £5 10s. for little more than weanlings. Springers and milch cows were in very fair supply and eager demand, particularly springers at their dropping, which rated at the highest prices of the season. The range of prices for springers was from £11 to £22 each. The sheep fair was an average,

and mutton continued to maintain its late value. Best wether sold at fully 84d. per lb.; ewe at 7d. per lb. for best; nothing good was left unsold. Bacon was fully 60s. per cwt; pork, 63s. per do on the foot. PARSONSTOWN: The show of colts and made horses was a decided improvement on former years; only second-class animals were exhibited. Yearlings brought from £5 to £9; two-year-olds from £8 to £12, and three-year-olds from £13 to £25. Mr. Faile purchased a three-year-old for £30. Pork brought fully 55s. to 60s. Store pigs were equally high, and brought from 50s. to 70s., according to size and quality; one month old fetched from 15s. to 20s. Ewe hoggets brought from 40s. to 50s. A very good supply of wether hoggets sold from 50s. to 55s. Lambs were in brisk demand, and brought from 35s. to 44s., and 47s. for a few. Lambs were very much enquired after, and sold from 30s. to 45s. The best lot of sheep were sold by Mr. Currie, to a Galway gentleman for £3 8s. STROKESTOWN: There was a decided rise in the price of beef of a good quality. Top lots of prime heifer beef commanded from 7d. to 7½d., second class 5½d. to 6d., and inferior from 4d. to 5d. per lb. There was a large supply of milk cows and springers, considering the advanced season of the year, while the demand was eager. The highest price (given by a Mr. Rafferty) for some prime-looking milkers was from £16 to £18 10s., springers £12 to £14. The sheep fair was one of the largest witnessed in this county for some years. Some top lots of fat wethers fetched high figures, the prices ranging from 63s. to 66s. each. The top figure for wether mutton

was 7½d. to 8d. per lb., while ewes sold from 6½d. to 7d. per lb. Hoggets fetched from 48s. to 58s. each. Weighty bacon hogs were in good demand, and ranged from £5 10s. to £6 each: store pigs sold from £2 10s. to £3 10s. each; slips from 25s. to 30s. each; weanlings sold at from 15s. to 17s. 6d. each. A great number of horses changed owners at prices ranging from £16 to £18 each. Long tails brought from £17 to £25 each. Horses of a good description, and adapted for general use, ranged from £22 to £27 per head; some sporting nags fetched from £30 to £48, and up to £50. PORTUMNA: Two-year-old heifers brought from £9 to £13, three-year-olds from £13 to £17, and some fat cows rated at from £11 to £15. Two-year-old sheep from £2 10s. to £3. Lambs were in fair demand, at from 35s. to 45s., and nearly all exposed for sale were sold. Several lots of hoggets went from £2 to £2 15s. Milch cows were brisk; demand good, and many sold from £12 to £15 10s. GORESBRIDGE: Sheep scarce, and pigs very few. Fat cows ranged from £11 to £14, milch cows from £14 to £16, two-and-a-half-year-old bullocks £10 to £13, year-and-a-half-old heifers £7 to £9 10s., yearlings £5 to £7, weanlings £3 to £3 10s. Fat sheep 59s. to 60s. each, breeding ewes 50s. to 55s., lambs 30s. to 35s., store pigs 35s. to 50s. each, bonhams 40s. to 45s. per couple. KILLENNAUL was well supplied with stock, which sold briskly. Fat cows £13 to £20, milch cows £14 to £18, strippers £10 to £12. Young stock in good demand from £8 downwards. There was a pretty good supply of sheep, which commanded a ready sale, as high as 60s. being got for some.

## REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The unusual heat and drought of September have been nearly balanced by heavy rains and a much lower temperature in October; but the harvest being previously gathered, no injury has accrued to any outstanding corn; but turnips and other esculents have been much benefited, and the lands previously too dry has been moistened sufficiently for the reception of the autumnal sowings—some of which were effected early on the light land, and we expect to hear of many strong plants before Christmas. The potato disease, however, has been progressing, and the crop is reducing fast; while the cattle murrain, notwithstanding all the efforts of science, continues its ravages among our herds. Let us hope, however, that this visitation will be entirely removed, or receive a salutary check as the cold season approaches, or it must eventually fall very heavily on the poor. As respects the present wheat crop, accounts continue to vary very widely—say from 2 qrs. to 7 qrs. per acre; but we fear an inferior yield, as well as quality, will be found to predominate, by the samples which come daily to view. As respects prices, the month has certainly shown a tendency upwards, and the gain has been fully 1s. per qr., with a certain amount of confidence not hitherto evinced. The fact is, our prices are lower relatively than in any part of the world, inasmuch that Dantzic agents and others bitterly complain of the want of business. Our impressions given last month have been strengthened by more recent accounts from abroad, that there is less prospect of a free importation than for years past; and, should any extraordinary demand spring up for breadstuffs from the failure of animal food, we really do not know what country to look to for the needed

supplies. We have, indeed, had fair arrivals lately, as the result of orders during the rains of August, when prices were rising, but these are already diminishing; and, in spite of the rise to 7 per cent. in discount, purchases have been freely made from the Black Sea for next year's spring delivery at advanced rates; and, by telegram from Odessa, we are informed of a rapid rise there, which fully agrees with a recent statement that the deliveries there are much less than usual, and of a quality also below that of the previous year. It is equally clear that our present prospects of imports from America is poor. At Montreal white wheat had risen to 53s. per qr., and spring wheat to 43s. per qr. of 480lbs., only as the consequence of a demand from the United States, both the West and the South being largely in need. Some parts of Germany and Poland are estimated at one-third less than an average produce; while France, Belgium, and Holland have short crops. The following quotations were recently current at the several places named. At Paris the range of prices for wheat was 38s. to 43s.; at Antwerp red wheat was worth 48s., at Maestricht in Holland 44s. Hambro' quotations were much above those here, red Wahren being quoted 46s. 6d. per qr. At the Danish ports red wheat was 42s. 6d., cost and freight; at Cologne the price was 43s. per qr.; Berlin prices were 35s. to 41s.; Straubing, in Bavaria, to 36s.; Ghirka wheat, floating cargoes off the coast, to 43s. 6d.; red wheat at Venice 37s.; Montreal quotations, as previously noted, 43s. to 53s. per qr. of 480lbs. New York advices were for Chicago spring 39s. 8d., Milwaukee 40s. 6d., amber Michigan 51s. 6d., all per qr. of 480lbs.; so that English orders were as so

much waste paper in merchants' offices, from their being considerably below present quotations.

The first Monday in Mark-lane opened on fair English and liberal foreign supplies of wheat. The show of samples, however, from Kent and Essex during the morning was deficient, and the smaller portion of this being fine went off readily at fully the previous quotations. There were some country buyers of dry Russian qualities for mixing with the new crop, and occasionally 1s. per qr. advance was realised, all fresh qualities being held very firmly. A good business was done in floating cargoes at something above the previous currency. Many of the country markets followed the improved London feeling—viz., 1s. per qr. advance. Among these were Hull, Spilsby, Sheffield, St. Ives, Hereford, Wolverhampton, and Bristol; while Liverpool was 3d. per cental dearer for the week. Glasgow prices were not raised; but at Edinburgh there was an advance of 1s. to 2s. per qr. Irish prices were little changed, but most markets were firm.

On the second Monday there was a better supply of English wheat, and very large arrivals from the Continent, chiefly from Dantzic and Russia. There were not many fresh samples sent up in the course of the morning from Kent and Essex. Higher prices were at first demanded; but millers refused to go beyond the previous rates, at which good samples went off freely. The heavy foreign arrival rather staggered the market for those qualities; but there was no disposition on the part of holders to make any sacrifice, and prices were nominally unchanged. Cargoes afloat, however, were sold at 1s. per qr. reduction. Prices were generally well supported this week throughout the country for all fine and dry qualities; but where the sale of damp parcels was forced, farmers had to take rather less money. Among the markets so described were Hull, Boston, Wakefield, and Liverpool. At Edinburgh prices were 6d. to 1s. per qr. higher; but Glasgow was again unaltered. The supply of home-grown wheat at Dublin being very short, there was a ready sale on fully former terms; at Cork there was no change.

There was much less wheat on the third Monday in the returns, but still good supplies of foreign. Very few samples came up this morning from Kent, but rather more from Essex, making together but a moderate show. Good qualities were again in fair request; but inferior were more completely neglected. A retail demand was kept up for all useful foreign, but the speculative movement was discouraged by the high rate of discount. Cargoes afloat were more in request, and the prices made exhibited some reaction on the late decline. The trade in the country this week was more decidedly upward for fine qualities, and many markets realized 1s. per qr. improvement. Among these were Boston, Birmingham, Bury St. Edmunds, Burton-on-Trent, Hull, Ipswich, Newbury, Sandwich, Aylesbury, Cambridge, Chesterfield, Huntingdon, and Leicester; Liverpool showing some improvement on Friday. Edinburgh was rather dearer for fine wheat, and Glasgow rose 3d. to 6d. per boll for American qualities. At Dublin there was an advance on native

wheat of 6d. per barrel, and foreign was held at more money.

On the fourth Monday the arrivals of English wheat were moderate, and so were those from foreign parts. The show of samples this morning from Kent was almost nothing, and that from Essex was very small; but samples not being in good condition, and factors asking more money, very little business was done. Some of the best lots were sold at 1s. per qr. advance, and the bulk was held at the same rate, but not disposed of at a late hour of the day. The foreign trade was more decidedly improved, and 1s. advance freely paid on all good Russian and Dantzic qualities, while a similar advance was realized on floating cargoes, with a good demand for spring delivery. On the same day, Newcastle-under-Lyne was 2s. per qr. dearer, and St. Ives 1s. to 2s. per qr., and most of the later markets were about as much dearer.

The imports into London for the four weeks were, in English qualities 34,057 qrs., and in foreign 123,383 qrs., against 31,536 qrs. English and 96,691 qrs. foreign for the same period in 1864. The general average commenced at 42s., and closed at 41s. 11d. The London average began at 43s. 7d., and closed at 43s. 10d. per qr. The imports into the kingdom for four weeks ending 14th Oct. were 2,578,537 cwt. wheat and 343,280 cwt. flour. The London exports in the same time were trifling, viz., 6 qrs. wheat and 136 sacks flour.

The flour trade throughout the four weeks has been very steady, prices not having varied throughout, the diminished imports from abroad having caused a better demand for home manufacture. Norfolks have ranged from 31s. to 33s. per sack, and the top price of town-made has stood at 43s. per sack. American barrels being very scarce, have kept at a high range, say 22s. to 27s.; and with the last high quotations from New York and Montreal, it is clear there is very little chance of many being sent on to England, there being a demand from the West and South. The imports into London for the four weeks were 73,539 sacks country and 868 sacks 13,551 barrels foreign, against 63,762 sacks English and 885 sacks 30,770 barrels foreign for the same period in 1864, showing considerable falling off in barrels.

The warm weather lasting so long, there has been very little opportunity for business in the malting qualities of barley; and so little really fine has been sent to the London market that its precise value can scarcely be given; but there has been more than enough of secondary sorts, mostly stained, and so inferior in condition that sales have been not only difficult, but oft-repeated, from the bulk proving inferior to sample. While this has been the state of the English market, there has been a gradual advance both in fine and low foreign sorts to the extent of 1s. to 1s. 6d. per qr. during the four weeks, and the market closed with an upward tendency. The imports into London for four weeks were 12,171 qrs. English and 44,213 qrs. foreign, against 10,691 qrs. English and 31,479 qrs. foreign in 1864.

The malt trade has been steady through the



month for fine old qualities; but the new proving very variable, and the best 5s. per qr. below the value of old, has not yet been in much request.

The oat trade, notwithstanding free importations, has gained 6d. to 1s. per qr. value on the prices of the previous month. The first Monday was marked by a general decline of 6d. per qr. On the second there was a dulness, and some reduction on Russian sorts, this being the week of greatest imports; but with a less quantity on the third Monday, 6d. was recovered; and the fourth was remarkable for a rise of nearly 1s. per qr. on free imports. This may be partly attributed to the fact that Russian merchants preferred landing to selling, in the conviction that this grain must be dearer, as our own crop has proved deficient, and that abroad has been less favourably reported than for the average of seasons. The imports into London for the four weeks were, in English sorts 11,935 qrs., Scotch only 705 qrs., Irish 6,715 qrs., foreign 209,801 qrs., against 6,873 qrs. English, 9,414 qrs. Scotch, 15,824 qrs. Irish, 254,221 qrs. foreign for the same period in 1864. We think a further moderate advance very probable, especially should the weather prove so severe in winter as to close the Baltic for a long period.

Very few English beans have yet been to market, and though the quality has proved good, and condition dry, old sorts have run so short that prices have further advanced 1s. per qr.; indeed, our dependence on foreign supplies since the failure in Egypt seems very doubtful, as the crop in Algiers has been deficient, and the only check to a further advance will be the low price of oats, barley, and maize. The imports into London for the four weeks were 2,885 qrs. English and 7,212 qrs. foreign, nearly all the latter arriving in the fourth week. The imports for the four weeks for the same period in 1864 were 2,166 qrs. English and 5,507 qrs. foreign.

In the value of peas there has scarcely been any change through the month, except in the instance of fine boilers, which have improved 1s. per qr., the best being now worth 42s. to 43s.; and all will depend on the hardness of the winter whether there will be any material advance or not. Maples have continued dear, very few being now grown; and grey and dun sorts, being new, have not been in much request, from the low prices of barley and Indian corn. The imports of this grain into London for the four weeks were 3,000 qrs. English and 8,634 qrs. foreign, against 2,132 qrs. English and 4,785 qrs. foreign for the same period in 1864.

Though the imports of linseed have doubled last month, the smallness of stocks and value of oil have kept up rates to fully their previous range, and the long continuance of drought made a good demand for English cake all through the month. There seems no prospect that the present range of prices will be lowered.

Transactions in French red new cloverseed have commenced at moderate rates; and as prices have rather improved in France, we think there is more prospect of improvement here, as stocks were hardly ever lower than at present, from the miserable crop of last year. The estimate of the pre-

sent crop is but moderate, though some of the new samples have proved very fine. Mustardseed has been dull. Canary has advanced about 4s. per qr., with a prospect of still further improvement; but winter tares hang on hand at 5s. to 5s. 3d. per bushel, the quantity grown apparently exceeding expectation, but the quality has generally been inferior.

### IMPERIAL AVERAGES

For the week ended October 14, 1865.

Wheat .....	80,312 qrs.	41s. 11d.
Barley .....	40,340 "	30s. 8d.
Oats .....	6,537 "	30s. 11d.

### AVERAGES

For the last six weeks:	Wheat.	Barley.	Oats.
	s. d.	s. d.	s. d.
Sept. 9, 1865 .....	46 0	31 3	23 1
Sept. 16, 1865 .....	44 7	30 10	20 11
Sept. 23, 1865 .....	43 0	30 2	20 10
Sept. 30, 1865 .....	40 10	29 11	20 2
Oct. 7, 1865 .....	41 1	30 4	20 5
Oct. 14, 1865 .....	41 11	30 9	20 11
Aggregate Average .....	43 9	30 6	21 1
Averages last year .....	38 9	28 3	20 6

### COMPARATIVE AVERAGES.

Years.	WHEAT.	BARLEY.	OATS.
	Qrs. s. d.	Qrs. s. d.	Qrs. s. d.
1861 ... 99,879	58 3	53,255	14,773
1862 ... 70,019	49 6	33,679	15,286
1863 ... 84,887	41 0	68,758	11,634
1864 ... 76,126	38 9	44,780	10,304
1865 ... 80,312	41 11	40,246	6,537

### PRICES OF SEEDS.

#### BRITISH SEEDS.

MUSTARD, per bush., white .....	10s. to 12s.
CANARY, per qr. ....	50s. 50s.
TARES, winter, new, per bushel .....	4s. 0d. to 5s. 6d.
CLOVERSEED, red .....	—s. —d.
CORIANDEE, per cwt. ....	—s. —d.
TRIFOIL .....	37s. 28s.
LINSEED, per qr., sowing 54s. to 62s., crushing .....	54s. 56s.
RAPESEED, per qr. ....	72s. 76s.
LINSEED CAKE, per ton .....	29 10s. to 210 10s.
RAPE CAKE, per ton .....	25 10s. to 28 0s.

#### FOREIGN SEEDS.

CORIANDEE, per cwt. ....	20s. to 22s.
CARAWAY " .....	—s. 33s.
TRIFOIL .....	26s. 26s.
HEMPSEED, small —s. per qr., Dutch .....	—s. 45s.
LINSEED, per qr., Baltic 58s. to 60s. Bombay .....	68s. —d.
LINSEED CAKE, per ton .....	29 10s. to 211 0s.
RAPE CAKE, per ton .....	25 0s. to 28 0s.

### HOP MARKET.

Mid and East Kents ...	115s., 147s., 190s.
Farnhams & Country ..	115s., 120s., 160s.
Weald of Kents ...	100s., 115s., 130s.
Sussex ...	95s., 105s., 112s.
Yearlings ...	95s., 120s., 140s.

### POTATO MARKETS.

#### BOROUGH AND SPITALFIELDS.

Kent and Essex Regents .....	60s. to 90s. per ton.
Yorkshire ditto .....	60s. to 80s. "
Flukes .....	70s. to 100s. "
Rocks .....	40s. to 60s. "

#### ENGLISH WOOL MARKETS.

CURRENT PRICES OF ENGLISH WOOL.	s.	d.	s.	d.
FLEECES—Southdown hoggets .....	per lb.	1	8	1
Half-bred ditto .....	"	0	3	1
Kent fleeces .....	"	2	0	2
Southdown ewes and wethers ..	"	1	8	1
Leicester ditto .....	"	1	10	2
Sorts—Clothing .....	"	1	6	1
Combining .....	"	1	7	2

#### LIVERPOOL WOOL MARKET.—Oct. 21.

	s.	d.	s.	d.
Laid Highland Wool per 24lbs. ....	18	0	20	0
White Highland do. ....	23	0	26	0
Laid Cheviot do. unwashed .....	23	0	30	0

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*Southdown Ram*

*Southdown Ram. The sheep on the left is a Southdown Ram, and the sheep on the right is a Southdown Ewe. The sheep on the left is a Southdown Ram, and the sheep on the right is a Southdown Ewe.*

## PLATE V.

### "ROYAL" SOUTHDOWN RAMS;

THE PROPERTY OF LORD WALSLINGHAM, OF MERTON HALL, THETFORD, NORFOLK.

These two rams were first and first in the aged and shearling ram classes at the Plymouth Meeting of the Royal Agricultural Society in August last, when their portraits were taken.

The old sheep on the left, aged two years and four months, known as "Emperor," is by the Merton second prize Battersea ram, out of a ewe by a ram bred at Babraham. At the Lynn show of the Norfolk Agricultural Society, in 1864, Emperor was never noticed by the judges; but at Plymouth he was equally appreciated by the authorities and the public, being purchased on the ground by Mr. H. E. Waller, of Harrington Lodge, Northleach. Emperor was used for one season at home.

"Royal Plymouth," the first-prize yearling, is by a great grandson of Raglan, the best ram in the aged class at the Chelmsford Meeting of the Royal Agricultural Society, out of a ewe by a Norwich prize ram. Plymouth was used in the Merton flock during the past season, and served eighty ewes.

We thus wrote of these sheep, on seeing them at Plymouth: "In a very good class of shearlings, Lord Walsingham still carried all before him, with great, heavy, fine-bodied sheep, the first and second being particularly good; and, as will be seen from the prize-list, scarcely any other flock noticed amongst the many commendations. The Merton two-shear sheep were also remarkable for their fine growth and weight."

Mr. Dent Dent, in his report, as senior steward, on the stock show at Plymouth, says that "Lord Walsingham, with the shepherd, seems also to have inherited the mantle of Mr. Jonas Webb;" and certainly the success of the Merton flock has of late years been very signal, as the following list will show:

In 1851, at the Norfolk Agricultural Society: First and second prizes for shearling rams, second for shearling ewes, second for shearling wethers, first for ten ewe lambs, first and second for rams of any age. At the Yorkshire Agricultural Society: First prize for shearling ram.

In 1852, at the Norfolk Agricultural Society: First prize for shearling ewes, first for shearling wethers, second for shearling wethers, second for wethers of any age, first for ram of any age. At the Smithfield Club Show: Second prize for two-year-old wethers. At the Birmingham Cattle Show: Second prize for two-year-old wethers.

In 1853, at the Norfolk Agricultural Society: First and second prizes for shearling rams, first and second for two-year-old wethers, silver medal for two-year-old wethers, second for ewes. At the Yorkshire Agricultural Society: First prize for shearling ewes. At the Smithfield Club Show: First prize and silver medal for wethers of any age. At the Birmingham Cattle Show: Second prize for shearling wethers.

In 1854, at the Norfolk Agricultural Society: First prize, silver medal, and second prize for rams of any age; first prize and silver medal for shearling ewes, second for shearling wethers. At the Royal Agricultural Society's Meeting at Lincoln: First prize for shearling ewes. At the Yorkshire Agricultural Society: First prize for shearling ram, first for shearling ewes. At the Smithfield Club: Second prize for shearling wethers, second for two-year-old wethers. At the Birmingham Cattle Show: Second for shearling wethers, and second for two-year-old wethers.

In 1855, at the Norfolk Agricultural Society: First prize, silver medal, and second prize for shearling rams; second for ram of any age; first prize and silver medal for ewe lambs; first prize, silver medal, and second prize for wethers; first for shearling wethers. At the Yorkshire Agricultural Society: First prize for shearling ram, first for shearling ewes. At the Royal Agricultural Society's Meeting at Carlisle: Second prize for shearling ewes. At the Smithfield Club Show: Second for shearling wethers. At the Birmingham Cattle Show:

First prize and two silver medals for shearing wethers, second prize for shearing wethers; first prize, silver medal, and second prize for wethers above one year old.

In 1856, at the Norfolk Agricultural Society: First prize, silver medal, and second prize for shearing ram; first prize and silver medal for ram of any age; first prize and silver medal for wethers; first for ewes. At the Royal Agricultural Society's Meeting at Chelmsford: First and second prize for rams of any age, first and second for shearing ewes. At the Birmingham Cattle Show: First prize, and two silver medals, with second prize for shearing wethers; first prize, silver medal, and second prize for wethers of any age. At the Smithfield Club Show: Second prize for shearing wethers.

In 1857, at the Fat Stock Exhibition at Poissy, in France: First prize and Gold Medal for wethers, second prize and silver medal for wethers. At the Norfolk Agricultural Society: First and second prize, and silver medal for shearing rams; first prize, silver medal, and second prize for shearing wethers; third prize for twenty ewes. At the Birmingham Cattle Show: First prize, silver medal, and second prize for shearing wethers; first prize, silver cup, and silver medal for two-year-old wethers. At the Smithfield Club Show: Second prize for two-year-old wethers.

In 1858, at the Norfolk Agricultural Society: First, silver medal, and second for shearing rams; first, silver medal, and second for rams of any age; first, silver medal, and second for shearing wethers. At the Birmingham Cattle Show: First, silver cup, and silver medal for shearing wethers. At the Smithfield Club Show: Second for shearing wethers, first for extra stock ewe.

In 1859, at the Norfolk Agricultural Society: First and silver medal for shearing rams; first, silver medal, second, and third for rams of any age; first, silver medal, and second for shearing ewes; first, silver medal, and second for wethers. At the Birmingham Cattle Show: Second for two-year-old wethers. At the Smithfield Cattle Show: Third for two-year-old wethers, first for best extra-stock ewe.

In 1860, at the Norfolk Agricultural Society: First, silver medal, second, and third for shearing rams; first, silver medal, and third for rams of any age; first, silver medal, and second for five shearing ewes; first and silver medal for three shearing wethers. At the Yorkshire Agricultural Society: First and second for rams of any age. At the Royal Agricultural Society's meeting at Canterbury: first for wool, second for five shearing ewes. At the Birmingham Cattle Show: First and silver medal for three shearing wethers; first, silver medal, Society's silver cup, and Innkeepers' silver cup for two-year-old wethers. At the Smithfield Club Show: Third for shearing wethers.

In 1861, at the Norfolk Agricultural Society: First, silver medal, second, and third for shearing rams; first, silver medal, second, and third for rams of any age; first, silver medal, and second for five shearing ewes. At the Royal Agricultural Society's Meeting at Leeds: Third for ram of any age, second for five shearing ewes, first for hogget wool, first for ewe wool. At the Birmingham Cattle Show: First for two-year-old wethers, Society's silver cup for best pen of short-woolled sheep in the yard, Innkeepers' silver cup for best pen of short-woolled sheep in the yard, first for ewe. At the Smithfield Club Show: Silver medal for extra-stock ewe, second for shearing wethers, and third for light-weight shearing wethers.

In 1862, at the Fat Stock Exhibition at Poissy, in France: Second and silver medal for ten-months-old wethers. At the Royal Agricultural Society's Meeting in Battersea Park: Second and third for rams of

any age, second for shearing ewes. At the Norfolk Agricultural Society: First, silver medal, second, and third for shearing rams; first, silver medal, second, and third for rams of any age; first and silver medal for shearing ewes; silver cup for the best ram or pen of sheep of any breed in the yard. At the Birmingham Cattle Show: First, silver medal, and second for shearing wethers; first, silver medal, and second for wethers under 32 months old; first and silver medal for ewe of any age. At the Smithfield Club Show: First for ewe of any age, second for shearing wethers, second for wethers under 32 months old. At the Liverpool Cattle Show: First and second for wethers of any age; silver cup for the best pen of sheep, of any breed in the yard.

In 1863, at the Norfolk Agricultural Society: First, silver medal, second, and third for shearing rams; first, silver medal, second, and third for rams of any age; first and silver medal for shearing ewes. At the International Exhibition at Hamburg: First and second for rams, first and second for ewes. At the Royal Agricultural Society's Meeting at Worcester: First, second, and third for shearing rams; first, second, and third for rams of any age; first prize for shearing ewes. At the Birmingham Cattle Show: First, silver medal, and second for shearing wethers; first, silver medal, and second for wethers under 32 months old; first and silver medal for ewes of any age; silver cup for best pen of short-woolled sheep in the yard. At the Smithfield Club Show: First and silver medal for shearing wethers; first and silver medal for light-weight wethers; second for wethers under 32 months old; first for ewe of any age; silver cup for best pen of short-woolled sheep in the yard.

In 1864, at the Norfolk Agricultural Society: First, silver medal, second, and third for shearing ram; first and silver medal for shearing ewes. At the Royal Agricultural Society's Meeting at Newcastle-on-Tyne: First and second for shearing rams, first for shearing ewes. At the Birmingham Cattle Show: First and silver medal for shearing wethers; silver cup, value £25, for the best pen of shearing sheep, of any breed; second for shearing wethers; first and silver medal for wethers under 32 months old; silver cup for the best pen of short-woolled sheep in the yard; second prize for wethers under 32 months old; first, silver medal and second for ewes of any age. At the Smithfield Club Show: First and silver medal for shearing wethers; second for light-weight wethers; first and silver medal for wethers under 32 months old; first for ewe of any age, and silver cup for best pen of short-woolled sheep in the yard.

In 1865, at the International Exhibition at Stettin, in Pomerania: First for shearing ram, and first for shearing ewes. At the Norfolk Agricultural Society: First, silver medal, second, and third for shearing rams; first and second for rams of any age; silver cup for best Southdown ram in the yard. At the Royal Agricultural Society's Meeting at Plymouth: First, second, and third for shearing rams; first and second for rams of any age; second for shearing ewes.

All these prizes were, of course, taken with Southdowns, Lord Walsingham having laid the foundation of his flock at Babraham, where his agent, Mr. Henry Woods, was for years a free bidder. Mr. Woods has pointed his experience in the fold and the yard by a very able essay on the management of a sheep, while a lecture recently delivered by him on the diseases of sheep will be found farther on in the present number.





*A Christmas Greeting*

*C.B. Fiddling*



## PLATE VI.

## A CHRISTMAS HOLIDAY.

Perhaps no one looks forward with greater glee to a Christmas holiday, or enjoys one more, than the lad for a taste for field sports, just turned loose from school. No friends—no matter of how long standing, or how long separated—can be more glad to see each other, or give one-another a more genuine, hearty greeting, than the absentees of six long months and his brace of spaniels. The lad is no sooner home than he is away to old Dash and Fan. They recognise him in an instant, and are in

such ecstasies that Master Harry can scarcely slip their collars. There is no end or bounds to their joy, for they are up and down, about, all over him, as if they really could not believe he was one of them, whilst he looked so clean and so prim. The saddle is on old Bobby as quick as Jack Robinson can get it on, the ferret in the bag, and the jolly lot are fleeting away to the Warren, to be inseparable for the quickest time we ever spent—the six weeks of a lad from school—his Christmas Holiday.

## THE SALTS OF SODA.

BY GUTHBERT W. JOHNSON, F.R.S.

The use of the salts having soda or potash for their base has long been a moot-point with those who have laboured to apply science to agriculture. That all vegetables contain potash is well known, and yet almost all applications of its salts as fertilizers have proved of doubtful value. The same remark applies to the salts having soda for their base. They are found in far more limited proportions in plants than those of potash, and their power as manures are equally doubtful. The experiments hitherto reported in which they were employed have produced very discordant results. The only exception to this occurs in the case of those salts which contain nitric acid. The nitrate of soda (cubic petre) and the nitrate of potash (saltpetre) are of well-known value as powerful manures; but then, very unfortunately, these are the most expensive of the salts of soda and potash; while saltpetre is about 35s. per cwt. and cubic petre 15s., sulphate of soda (Glanber salts) is only worth 5s., and common salt about 1s. 6d. per cwt.; and an impure soda is very cheaply obtained by mixing together lime and common salt.

It is therefore very desirable that in so very little understood a research further inquiries should be made, and far more careful experiments instituted than those whose results we now possess. We should indeed, in all such researches, ever bear in mind the danger of arriving at rapid conclusions, in trials where vegetable life is concerned. The mysteries we encounter at every step we take should teach us caution and patience. It was after long and laborious inquiries as to the salts of soda that Professor Voelcker lately remarked, in a paper well worthy of the reader's very careful perusal (*Jour. Roy. Ag. Soc.*, N. S., vol. i., p. 802): "All soils possess a wonderful capacity of adapting or converting crude fertilizing substances into combinations fitted to support the process of nutrition of plants. The changes which soluble fertilizers undergo in contact with soils of various characters are frequently quite unexpected. The results of filtration experiments are very much influenced by the composition of each individual soil operated upon, and by the strength and even the quantity of the saline solution brought into contact with it. We must, therefore, be careful how we attempt to deduce from the results of special experiments an universal or natural law of husbandry. The results of such experiments are not without value; they hold good, however, only under the particular conditions under which

they were performed in the laboratory, and probably many more years of hard study and conscientious self-denying work of many intelligent practical observers will still be required, before our knowledge of the mysterious process of vegetable nutrition will be much advanced."

These conclusions of the learned professor may well precede his other very valuable observations, as he step by step treads carefully in his search for truth. He tells us, very truly, moreover, (I here give his own words), that "in an agricultural point of view soda and its salts are far less important fertilizing agents than potash and its saline combinations. The published ash-analyses of every variety of agricultural produce show that all cultivated plants, without exception, contain much more potash than soda. This is not due merely to accident, or, as might be supposed, to a wider and more abundant distribution of potash than of soda in the mineral kingdom, for the rule holds good even when plants are grown on soils in which the proportion of soda greatly exceeds that of potash. It matters not what the composition of the soil is on which a crop of wheat, oats, turnips, &c. is raised; invariably the amount of soda in the ashes of these and other plants will be found to be quite insignificant in relation to that of potash. Plants appear to have not only the power of taking up potash from the soil, but also of retaining this alkali, and using it for building up the living organs of the plant.

"Soda and its saline combinations unquestionably are also taken up by plants from the soil and circulated throughout the vegetable organism; but it is questionable whether soda, like potash, is ever transformed, in conjunction with carbon, hydrogen, nitrogen, and other elements, into a living organ, in which the properties of the alkali are no longer recognisable, but are as completely changed as those of hydrogen, or carbon, or oxygen when entering into chemical combination with each other.

"It is true we find soda-salts, more especially common salt, in almost every kind of agricultural produce, and their presence is commonly regarded as a proof that they are absolutely necessary for the very life and growth of our cereal and forage crops. The mere presence of certain constituents in plants does not, however, prove that these constituents are indispensable. Such a conclusion is only well established when the withdrawal of one or more elements of nutrition, or the substitution of others

in their place, is marked uniformly by an unhealthy growth and final failure. Thus we know positively that no plant can grow healthily without phosphoric acid or potash, since numerous attempts to find a substitute for them have all been totally unsuccessful. Hence our present state of knowledge entitles us to consider these two substances to be essential ash-constituents of all plants.

"On the other hand, the fact that mangolds, or grass, contain a good deal of common salt when the soil on which they are grown is naturally rich in salt, or has received a good dressing of it, does not by any means prove that salt is necessary, or even that it is, or may be, a useful manure for these crops.

"Like other soluble substances, common salt and most other soda-salts are readily absorbed by the rootlets of plants and conveyed into their sap, where they probably have important functions to perform in the living plant. What these special functions are we have yet to learn; all we know is that salt is taken up by plants, and, under certain conditions which require yet to be more clearly defined, has a remarkably good effect upon vegetation. Notwithstanding the large increase in the produce of corn or roots which has in many cases been realized by the use of salt, and its general presence in almost all plants, its base—the soda—cannot be regarded as essential to the luxuriant growth and maturity of plants. In many ash-analyses, made by our best and most trustworthy analytical chemists, soda is not mentioned at all, and merely traces of chloride of sodium are given. Ash-analyses in which soda does not occur are not isolated or exceptional cases, but may be readily found on looking over a list of such analyses endorsed by the names of Boussingault, Fresenius, Way, and other chemical authorities, who have failed to find soda in the ashes of some crops, and only insignificant quantities in others.

"It is further worthy of notice that whilst the amount of phosphoric acid or potash in our crops within certain limits varies but little, the proportion of common salt in green crops and grass, and cereals in an unripe condition, appears to be regulated entirely by accidental circumstances and to vary greatly. Thus in land like the salt-marshes the herbage is richer in this constituent than in upland districts, and on this account more relished by cattle than ordinary herbage. Again, mangolds that have received a heavy dressing of salt invariably contain a good deal of salt, more especially in their leaves, whilst roots grown without salt are comparatively poor in it. The difference between potash and soda in this respect is striking. No plant as yet has been found in which potash was entirely absent; and though a soil may contain but little of this alkali, plants have the power of extracting it and assimilating it—that is, using it for the building up of their own organism. Soda and its combinations, on the other hand, when present, occur in variable proportions in the sap of plants. Soda compounds do not appear to enter into such intimate organic combinations with carbon, hydrogen, nitrogen, and other elements, as potash and its combination. It is worthy of notice that common salt never occurs in perfectly ripe seeds, such as the grain of wheat, barley, or oats, even when the land upon which they are grown has been heavily top-dressed with common salt, and the analysis of the whole plant, root, stem, leaves, and unripe seed shows its presence in considerable quantities. Common salt, and soda-salts in general, as it would appear, circulate in the plant, assisting, in all probability, the assimilation of other inorganic or soil constituents without becoming themselves integral parts of the living plant. It may further be mentioned that Professor Kemp of Leipzig has succeeded in growing and maturing peas, beans, Indian corn, oats, barley, wheat, and other plants, in watery solutions, from which he excluded all sorts of soda. Lastly, it is well known

to every practical agriculturist that soda compounds, as a class, certainly do not belong to our most efficacious manures; and it is certain that the beneficial effects which nitrate of soda and a few other soda salts produce are mainly due to their acid, and not to their basic constituents. In the preceding remarks I have sufficiently stated the reasons which induce me to regard soda as a non-essential ash-constituent of plants. I have dwelt rather longer on this matter than may be deemed necessary, because I think the time has arrived when attention should be prominently directed to the distinction between essential and non-essential ash-constituents which I have been in the habit of drawing for more than eight years. The development of the doctrine of vegetable nutrition demands that such a distinction should be made, both in a qualitative and quantitative sense—that is to say, it is desirable that we should know positively, not only what soil constituents are absolutely necessary for the growth of our cultivated crops, but also what is the amount of each ash-constituent that has to be regarded as indispensable for bringing our various crops to maturity, and what is the amount which may be considered as superfluous or accidental."

"Although I do not look upon chloride of sodium and soda-salts in general as essential ash-constituents of plants, I am far from denying the beneficial effect which salt is capable of producing in particular cases. Indeed, my own experience leads me to admit that salt is a useful and cheap manure, which, judiciously applied, frequently yields a large increase of corn, roots, or hay, and seldom does any harm.

"On porous sandy soils, roots, especially when the season happens to be dry, are apt to pass so rapidly through all the stages of growth that their leaves begin to drop before they have had time enough on the one hand to collect atmospheric food, and on the other to accumulate mineral matter from the soil in sufficient quantity for the development of an abundant crop of bulbs. On such soils the application of 3 to 4 cwt. has given me a large increase in roots, and 7, 8, or even 9 cwt., so far from doing harm, increased the produce of mangolds by 2½ to 4 tons per acre. On the other hand, it does mischief when applied in excessive doses (and such I consider all quantities exceeding 5 cwt. per acre) to stiff wet clay soils, and soils generally which are cold, and which brize their grain, roots, and grass crops slowly to maturity, for salt has a remarkable tendency to prolong the period of vegetation. It will be seen that the value of a fertilizing agent does not always depend upon the fact that it is an essential element of nutrition; the substance which we apply to the land with a view of increasing our crops may have no value whatever as a direct fertilizer, and may, as is the case with chloride of sodium, not even make its appearance in our grain-crops, and yet it may be instrumental in materially raising the produce of wheat. Again, such non-essential salts in general may nevertheless play an important part in the nutrition of plants by assisting the solution and uniform distribution of fertilizing constituents which occur in the soil in a sparingly soluble or insoluble condition. It is well known to chemists that chloride of sodium exercises such a dissolving action upon several bodies, and thus it is not too great a stretch of fancy to assume that it will act beneficially in the field by dissolving and rendering available earthy fertilizing constituents which without its aid will remain in an inert condition for a long time. The remarkable changes which solutions of salts of *potash* undergo in passing through different soils naturally lead us to suspect that similar changes take place when dilute solutions of *soda-salts* are filtered through a soil."

The experiments which the Professor made upon the absorption of salts by various soils, all seem to show the

inferior attraction of these soils for the salts of soda. The experiments were made by mixing 3,500 grains of each soil with 41.52 grains of the salts, dissolved in 4 gallons of water. The results he obtained, first with a calcareous soil, to give his own words, showed—that 3,500 grains of this calcareous soil absorbed only 2.8 grains of soda contained in 5.28 grains of chloride of sodium, or 1,000 grains absorbed only 0.8 of a grain of soda. If we compare this result with the action of arable soils upon potash-salts, we find that the soil has far less attraction for soda than for potash. For instance, this same calcareous soil, of which 1,000 grains in the preceding experiment absorbed only 0.8 of a grain of soda, in a similar filtration experiment made with chloride of potassium, absorbed 3.578 grains of potash per 1,000 of soil. This, no doubt, is one of the reasons why soda-salts as a class are far less energetic manures than their corresponding potash-salts. If a soil is manured with common salt, and by the action of rain a dilute solution of salt is produced, a good deal of the salt will remain undecomposed in the ground. In the moist soil the salt exercises but a weak influence, which, however, produces a sufficiently marked effect upon the produce in the long run."

Under similar circumstances 1,000 grains of a stiff clay soil absorbed 1.057 grains of soda. 1,000 of the soil of a fertile sandy loam absorbed 0.62 of a grain; 1,000 of the soil of a pasture, 1 grain; 1,000 of a marly soil, 0.99 of a grain; 1,000 grains of a sterile ferruginous soil absorbed 0.62 of a grain.

We have, however, the results of certain experiments, made long since, which strongly incline us to think that Glauber salt (sulphate of soda) is worthy of a more extended trial as a manure than it has hitherto received. For instance, in the experiments of Mr. James Wilson, of Erskine, on grass-growing upon "a very good light soil," the following was the produce of hay per imperial acre:

The soil, simple .....	2 tons	0 cwt.
120 lbs. of saltpetre .....	2 "	17 "
120 lbs. of cubetpetre.....	3 "	0 "
120 lbs. of Glauber salt....	2 "	12 "
340 lbs. of gypsum.....	2 "	5 "

And in some experiments of Mr. W. Fleming, of Barochan, on winter rye, the various dressings being applied on the 14th of April, on a tilly soil which had been trenched, and produced potatoes the previous year, the following was the produce per rood:

		Straw.	Grain.
Soil, simple .....	—	1,024 lbs.	3½ bush.
Muriate of ammonia (sal-ammoniac) 5 lbs.	1,218	"	5½ "
Nitrate of soda.....	40 "	1,864	" 0½ "
Lime and potash .....	40 "	1,344	" 5½ "
Sulphate of soda .....	40 "	1,152	" 4½ "

It would appear from other experiments of Mr. Fleming that sulphate of soda (Glauber salt) may be a valuable dressing for leguminous crops. He remarks, "The first dressing was applied the 4th of May on some beans on a border in the garden; the drills that were dressed quickly took the lead of the others. There was no alteration of colour, but greater strength, and they *tillered wonderfully*. There were five or six stems from every seed sown, and the pods were larger and more numerous, and the beans in the pods a great deal larger than the same variety undressed. It was also put upon some of the ridges of the beans in the field, and with the same effect, and gave a very large crop. Upon peas in the garden it appeared to add little, if anything, to the strength of straw, but those that were dressed had a far greater number of pods, and those better filled, and the peas of a better flavour, and it seems a valuable dressing for all leguminous crops. When sown in the drills along with the peas, it nearly killed every one of them; while

the same quantity put on as a top-dressing to some drills next to them (where the peas were two inches high) did no injury."

Then we have the fact that not only sea-weeds, but the ashes of sea-weeds, are a powerful manure; and these ashes abound with the salts of soda. In 100 parts of sea-tangle, Hodges found:

Sand ... ..	2.7
Potash ... ..	8.2
Soda ... ..	25.8
Lime ... ..	5.2
Magnesia ... ..	8.5
Chlorine ... ..	11.7
Phosphoric acid ... ..	5.4
Sulphuric acid ... ..	20.2

Now the ashes of these sea-weeds are extensively employed in the Channel Islands. Mr. C. P. Le Cornu, in his prize essay on the agriculture of these islands, remarks upon the Isle of Jersey (*Jour. Roy. Ag. Soc.*, vol. xx. p. 40), "What is sown in most cases after potatoes, parsnips, or carrots; in this case the land is clean, and requires no preparation beyond manuring. The manure employed is generally vraise ashes, i. e., the ashes produced by the burning of dry sea-weed. Sea-weed is collected in great abundance on the coast, and dried for the purpose of burning. If the land be rich, as in most cases it is, having been highly manured for the root-crops, 2½ tons per acre of ashes will be deemed sufficient. A few days before ploughing these ashes are carted from a dry place (in which they are stored and kept as free as possible from the action of the atmosphere) to the field, where they are spread evenly on the surface.

And the use of these saline ashes as a manure is one that has prevailed from time immemorial, for in a work upon Jersey, by the Rev. Philip Falle, published in 1694, he observes, that "Nature having denied us the benefit of chalk, lime, and marl, has supplied us with what fully answers the end of them in husbandry—it is a sea-weed, but a weed more valuable to us than the choicest plant that grows in our gardens. We call it *vraise*, in ancient records *veriscum*, and sometimes *wrecum*, and it grows on the rocks about the island. It is gathered only at certain times appointed by the magistrate, and signified to the people by a public crier on a market-day. There are two seasons for cutting it, the one in summer, the other about the vernal equinox. The summer *vraise*, being first well dried by the sea-shore, serves for fuel, and makes a hot glowing fire; but the ashes are a great improvement to the soil, and are equal almost to a like quantity of lime. The winter *vraise* being spread thin on the green turf, and afterwards buried in the furrows by the plough, it is incredible how with its fat unctuous substance it ameliorates the ground, imbibing itself into it, softening the clod, and keeping the root of the corn moist during the most parching heats of summer. In stormy weather, the sea does often tear up from the rocks vast quantities of this weed, and casts it on the shore, where it is carefully laid up by the glad husbandman."

The Jersey and Guernsey Agricultural Society confirmed this report of the excellent effects of sea-weed ashes, in 1797, in their report to the English Board of Agriculture, when they observed, "It is judged that a chabot (half a bushel), strewed over a perch of ground in winter, or the beginning of spring, will be a sufficient manure. Our labourers are unanimously of opinion that it gives a full ear to the corn, and prevents it being laid—those who have any *varech* to sell may at all times get a chabot of wheat for a quarter or six bushels of *varech*." (*Com. Board of Agric.* vol. i. p. 216).

This very extensive use of the ashes of sea-weed (which we have seen contain more than one-fourth of their weight of soda) seems to support the conclusions of those

who have advocated the employment of a mixture of common salt and lime. This manure is made by mixing, *in a dry state*, two-parts of hot lime with one part of salt. After they are well incorporated, the lime and salt should remain undisturbed under a dry shed, or well covered with sods for two or three months. The salt in that time is gradually decomposed—carbonate of soda and muriate of lime, a deliquescent salt, very likely to be useful on dry soils, are produced. This mixture of soda and muriate has been often successfully employed as a manure from almost the days of the alchemists, the last of that

fraternity, the celebrated Glauber, describing it as a universal medicine for vegetables.

We may then, on the whole, fairly conclude that we have much still to learn with regard to the agricultural value of the salts of soda. They form a valuable class of which two, cubic petre and common salt, are of undoubted service to the agriculturist; and if we are in doubt as to the uses to the farm of two of this great group of salts (Glauber salt and carbonate of soda), it is probably for want of that information, as to its mode of application, which future careful examinations may afford.

## THE HERDS OF GREAT BRITAIN.

### CHAPTER XLVIII.

#### THE EDENBRIDGE AND COURTLANDS HERDS.

The hop season was over. One or two old hop hags were left half-drunk by the station-door, with their unkempt hair straggling over their faces, and shaking their fists impotently at the railway policeman; but the rest of the pickers had tied up their bundles and their potato kettles, and departed, singing and shouting, to their London lair. There were no charms for us in the withering bine bundles, which some use for straw, some for thatching, and others "win" for fodder; and we were not sorry to quit Kent. Our last halt was at Edenbridge, in the parish of Westerham. Mr. Murton Tracy's residence is rather more than a mile from the rail, and just at the foot of the southern slope of the line of the "green sand" hills, which run parallel with the great chalk range, or the "backbone of the county." From that fir and juniper-covered height, the Wealds of Surrey, Kent, and Sussex seem to spread themselves out in all their fatness; and the oak flourishes, like a "weed," in every hedgerow. The situation of the Red Hill farm is remarkably warm and sheltered; and the ground gradually falls from it down to the Eden, one of the principal sources of the Medway. Even in the eyes of The Fancy, whose faces were generally Kentwards on the Tuesdays of their prime, Edenbridge has an historical value, as the spot where poor Tom Sayers met Dan Collins twice in one day, with Tom Spring and the veteran Vincent Dowling to look on. The farm of Red Hill comprises about 200 acres, of which fully half is devoted to permanent grass. The soil is very much intermixed—sandstone hills on the higher part, and would clay below. It grows fine wheat—in some years 65lbs. to the bushel—and is favourable for clover, but not so well suited to oats, unless grown after turnips. The course is generally a six-shift: fallow or green crop, wheat, seeds, oats, pulse, wheat. A portion of the pulse-tith is devoted to a summer fallow which in autumn is sown, like the rest, with wheat. The portion which was fallowed is well manured and deeply ploughed, and then stirred and worked with the scarifier, as early in March as it will bear the horses. A little more scarifying and harrowing-in of dung will prepare the ground for mangolds and swedes, which take exceedingly well when put in with some artificial manure; but this plan was only arrived at after many unsuccessful trials. A great deal of cider is made from the common sorts of apples; the hops, Goldings and others, are of fair quality; and Dorkings are the prevailing poultry. The cattle of the district are ordinary unpedigreed shorthorns; and suckling calves seems their great milk mission. These calves are bought by dealers at Croydon from the dairies in and round London; and three batches are often suckled in the year, of which the

third, when weaned, forms part of the regular stock of the farm.

The first pure shorthorn that ever came to Red Hill was Rubini (15210), a handsome roan bull, which was bred by the late Sir John Lubbock, whose stock, which his widow has always felt a great interest, has done so much good in North Kent. The Hendon sale, in 1855, furnished Cleopatra 2nd, by the Earl of Dublin (9180). With her, came Douglas (12714), a son of the 680-guinea Duke of Glo'ster and Dolly Varden, of the Gwynne tribe. Snowberry and three others then joined company from Sir John Lubbock's; and so did Olgar: Florimel, from Sir Charles Knightley's; Caroline, by Second Cleveland Lad, from Mr. Harvey Combe's; and Ratifia, from Mr. Marjoribanks. These cows, or their produce, were dispersed at the first sale in '59. Two females and four bulls of the Cleopatra tribe were then sold; and Mr. Noakes gave 78 guineas for Cleopatra 4th. There were several other good prices, and among them Snowberry (Mr. Rich, 55 guineas). Florimel, which had been bought at Sir Charles Knightley's sale for 6 guineas, made 10 guineas more to Mr. Hales's bid. Ratifia (65 guineas) became Mr. Christy's; and her daughter, Miss Butterfly, the top lot, passed, at 100 guineas through Mr. Sheldon's hands, to the Americans, and was shipped with Grand Duke of Oxford (16184).

Sir Charles Knightley used to say: "Two things are certain when I die—those Radical Northampton shemakers will never put up their shutters for such as old Tory; and Mr. Strafford will have 'a small but select herd of Shorthorns' to sell." And so it is. Men are weary of hunting and of racing, but the lover of Shorthorns is as staunch to the death as the fisherman or the cockfighter; and hence Mr. Tracy determined to reserve the two Cleopatras, as he dearly loved the Earl of Dublin and the other triple Princess cross, in their pedigree, through Bellerophon (3119), Waterloo (2816), and Young Wynyard (2859).

Before grass had time to grow in the other stalks, was off to a sale in the neighbourhood, and brought back Quaint, Germanium, Queen, and Quartz, the latter two both daughters of Quaint, who went back into the Beauty of Young Barmpton (3088) sort, but was spoilt by her sire Castor (17512). Gradually lots from Lenton, Milecote, Crawley, and Farnboro' came in, and Sweetheart 3rd (who inherits four direct crosses of Favorite, through her sire Daybreak), and her grand-daughter Starlight, established the Sylph by Sir Walter sort in Kent. Through Daybreak (11838), Mr. Tracy had also that Earl of Dublin dash once more, which he has so jealously reserved in his Cleopatra 3rd by The Baron. The latter bull by Baron Waraby, from Bon Bon, was bought

from Mr. Antony Cruikshank for 150 gs., specially to cross the Sweethearts. He had been sold twice before: once for the same sum by his breeder, Mr. Challoner, of Kingsfort, after winning a first prize at Dublin Spring; and again for 155 gs. as a two-year-old at Hendon. It was cheap enough for such a hardy bull, who had also done such yeoman service for Sittyton. He came from the county of Bon Accord to meet his own blood, as Cleopatra 2nd was in calf to him with Cleopatra 3rd, when she was bought at Hendon. Mr. Barnes's Duke of Leinster (17724), a pure Booth bull, was also used in the herd. He was hired by Mr. Waldo, of Stonewall Park, about five or six miles away, and came subsequently for half a year into residence at Red Hill, where The Marquis (20961) and his sire The Don (18980), one of them from Cleopatra 3rd, and the other from Sweetheart, had held the ground in turn.

With the exception of The Marquis, the Cleopatras and Sweethearts were all reserved when the second sale took place in July, 1865, and, owing to this fact, and the general election, the average was very low. Mr. Tracy has thus fairly chosen his line of blood; and we found him with fifteen in September, five males and ten females. Cleopatra 3rd, by the Baron, has been a regular breeder; but with the exception of Cleopatra 5th, by the Duke of Leinster, they have all been bulls—to wit, Duke of Albemarle and Last of the Barons. Both the "Thirds" were sent to Duke of Leinster at Stonewall Park; but Sweetheart missed to him. Despite this mishap, which was rectified in due season, this cow is the foundress of a prolific tribe, which she began with twins, Sweethearts 5th and 6th, by Mameluke. The Marquis (20961) next arrived; then roan twins again to The Baron—Baron of Rathcool, and Sweetheart 9th; and, lastly, another Baron daughter, Sweetheart 11th. Sweetheart 5th seems to inherit much of her dam's fertility, as she has already produced three calves—Sweetheart 7th and 10th by The Baron, and a bull-calf by Duke of Leinster; and Sweetheart 6th has also had a Duke of Leinster bull-calf and a Baron heifer. Mr. Tracy is crossing the two lines, and uses Duke of Albemarle and Last of the Barons from the one side of the house, and Baron of Rathcool from the other. The family tree is rather a difficult one to master, as Duke of Albemarle is one-fourth Sweetheart 3rd on his sire's side, and the Baron's blood forms such a strong catenary chain between the two families. Still Mr. Tracy apportions the dams very carefully: Sweetheart 3rd and her twin Mameluke daughters the 5th and 6th were all in calf to Duke of Albemarle; and a double cross of the Baron was in process of achievement by putting Baron of Rathcool to Cleopatras 3rd and 5th, and also to Sweetheart 7th.

But even Shorthorn heraldry will pall, and we wanted to be "in the open." That doesn't just seem the word, as the meadows here are very snug, and surrounded by high hedges, backed by regular Kentish copses, and fringed by the Ontarian poplar, with its green and yellow hues. Sweetheart 5th, a red roan Herd Book heroine, was one of the first we met. She is a very nice, useful cow, shorter in the leg and deeper in the flesh than her twin sister; and somewhat recalling Mr. Douglas's Rose of Sharon. The old cow herself is a short-legged white, and beginning to give slightly in the loin; and we looked with still greater interest for the deep-middled Cleopatra 3rd, a healthy hardy old dame, and the first shorthorn that Mr. Tracy ever bred. Cleopatra 5th is a red and white, of great substance, and with a well-turned breast; but except on that point, she has not exactly sacrificed to The Graces. A gay growthy heifer, with a nice picture head, proved to be Sweetheart 7th. Sweetheart 8th did, perhaps, more for the hand than the eye; and the squarey deep-fleshed roan, with no "hole for your hat" behind the elbow, was

Sweetheart 9th, the twin with Baron of Rathcool. From thence we bent to the right, past the marl pit, or miniature Devil's Punch Bowl, on whose margin 50 South-down wedders were browsing, and so round into the yard.

The hops had been dried in the east-house (which we once heard an Alliance man term "a hypocrite under a cowl"), and departed to the brewer in the bags with the black-horse brand of Kent, so we had no pencillings to reward our search. Two yearlings, Sweethearts 10th and 11th, the produce of dam and daughter, were in the boxes below, of which the 10th especially was a nice red, level below and above, with a good Booth rib, and deep in her flank and flesh. Near them were the two Duke of Leinster bull calves, from Sweethearts 5th and 6th, the former more level, and the latter perhaps the best in his hair and handling. Duke of Albemarle looked full of constitution; and Baron of Rathcool has a nicely laid shoulder and pleasing head. The last of the Barons (and singularly enough, from Cleopatra 3rd, by the Baron), a clever calf, for which a long price has been refused, next showed his little Roman head, "set on like a button," as they say in Scotland; and then we ruminated over the skull of the old Baron, of whose well-spent lifetime we had such solid proofs, both here and at Sittyton, and who died of bronchitis, when "the wind was in the east," early in the spring of last year.

Those who wish, like ourselves, to combine a peep at this Kentish herd with the only Royal prize shorthorn herd in Sussex, must either ride or trudge it for thirteen miles over the Ashdown Forest, or go round by Redhill to the East Grinstead Junction, which is about seven miles from Courtlands. Mr. Sharpe's shorthorn love is of no recent growth. He was born in Durham more than fifty years since, and soon caught the county spirit. In his boyhood he had listened with eyes and ears to Old "Jacky Hutchinson's" praises of Sockburn Sall, and longed to realise the aspirations expressed in "Jacky's" burning lyric:

"Thick in the rump,  
Small in the tail,  
Good for the butcher  
As well as the pail."

Willie Stephenson, the breeder of Belvedere, was also walking the earth, and Tommy Bates, Tempest, Wood, Major Rudd, Kit Mason, and the Robsons were still true to the cause of the Durham, and hence these early Glassynook impressions have never been lost. His first essay with a herd was at Hewels Field Court, near Chepstow, some sixteen years since. It consisted of some heifers, partly of Booth blood, a few Gloucestershire crosses, and a Maynard bull. During those eight years, he won some prizes at Coleford and Chepstow, and when he parted with the herd in '59, and left for the Brazils, he sold some of his best cows with their calves at 50 gs., and a yearling bull beyond that price. He returned when his railway contract was fulfilled in '62, and buying back two cows of the old blood from a friend, he purchased Courtlands and started afresh. This estate, of which he has 450 acres (about half of it grass) in his own occupation, is on the old Sussex sandstone, with a clay top, and is very good bean and wheat land. Mangolds and swedes have also done well, while barley and common turnips put in late are generally inferior.

The herd, which now numbers about sixty, commenced with the purchase of six cows and heifers (among which were Lady Windsor and Clytemnestra) and a bull, The Wizard, by private contract from Mr. Stratton. Mr. Hales of North Frith's sale added three, and Mr. Jonas Webb's five, including the 400-guinea bull Lord Chancellor; and five from Mr. Noakes's and four from Mr. Maynard pretty nearly made up the first two-dozen. These

was many a bitter blank among them in the breeding line, but the result both at store and Christmas shows has far outweighed those losses. Mr. Sharpe has always liked showing, and he has now six or seven going on for the next year's campaign. This year his career was cut short by the dread of the rinderpest, or else Lord Chancellor and a bevy of fair dames would have begun at Doncaster and taken a regular round on that Northern circuit. Now that the great Towneley, Douglas, and Gunter lots are no longer seen there, and Lady Pigot is not in her old strength, the need of some new blood is sorely felt in the prize ranks.

Mr. Sharpe may be said to be making his stand with Lord Chancellor (for whom, as well as Miss Emily, the late Mr. Clark Irving "sent him along) upon the Babraham, the Maynard, and the Cherry blood, the latter of which comes in through Bolden's Cherry Duke 3rd, in Elegant and Lady Bountiful. The calves all suck, and as it was important to establish the herd through tail female as soon as possible, Mr. Sharpe determined to test the French conception theory. Respecting the English one, whatever it may be, which was so solemnly confided to representative breeders of different countries, we have heard but one comment on authority: "*We should be afraid to try it except on a donkey.*" As the French one was open to no such objections, all the Courtland cows and heifers were put to just as the season was beginning to go off them; and out of the sixteen so experimented upon, not one has failed to produce a heifer calf. John Richardson, the herdsman who graduated under John Ward, when he was at Aldborough with Mr. Wetherell, was a great sceptic at first; but even his patience had been exhausted, as bull-calf after bull-calf came, and he longed for a crop of "ladies in red" with the white Chancellor mark on each side, just behind the shoulder.

Mr. Sharpe has always made ventilation a great point, and his principal house is built of corrugated iron sheds in three distinct rows, and with very open circular roofs, the middle one of which merely covers the passage between the boxes. Three Lord Chancellor bull-calves were there—a gay-looking roan from Cleopatra 4th, a red from Miss Emily, and a roan from a Windsor cow, and the thickest of the lot. Elegant's heifer-calf Lady Elegance had "Lord Chancellor his mark" in perfection, and did him much credit, and so did another red from Maynard's Heiress. This bull has quite driven The Wizard by Young Windsor into the background; but, when we had caught a glimpse of that fine, speaking head over the door, we were sure that there was a world of good behind. He has lived quite an anchorite life since the rinderpest, as, of course, Mr. Sharpe would allow no strange cow near the place, and his Lord Chancellor reversions are small indeed. At Tonbridge Wells two years since he beat a large field of bulls; and his good flesh, very short leg, and specially neat hind leg and deep twist would have carried him farther, if he had not rather run to gut, and unsettled his top thereby. The Lord Chancellor has a very sweet but not so masculine a head, and is a little plain at the putting on of his tail, and not quite first-class in his handling. Still, we may "wander many a weary fit" and not find, take him altogether, a much neater bull. Lord Strathallan was once very much inclined to send Fosco to Plymouth; but, fearing the long sea voyage from Glasgow to Bristol, he did not enter him, and he was specially kept for Doncaster. The meeting at either place would have been a very interesting one, as the white was a second last year to Forth and Van Tromp at The Royal and The Highland Society, and a vastly improved bull since then. The red has been shown four times, and never missed a first prize; and at Tonbridge Wells he met and beat Mr. Betts's Third Duke of Thorndale,

The cows were principally in the park. Among them were Lady Richmond by Oxford 2nd (18507), a regular slasher in point of size, and her own sister Heiress, "always a great favourite of Mr. Wetherell's," on John Richardson's authority; and when we have said that, we have said enough. She is a daring, stylish-looking lass, and we can quite believe that she jumped over a wall at the sale. Lady Ducie, of the Dodona tribe, stood appropriately enough under an oak, and in colour must have been very similar to "t'and yellow cow," on whose merits breeders delighted to "set off" old Anthony Maynard in a cozy evening's chat. Bonny Star by Oxford 2nd is a very clever roan; and near her stood Miss Emily, one of those buxom five which Jonas Webb showed side by side in the cow class at Battersea, against Queen of the Ocean and Pride of Southwicke. She has well repaid the 100-guineas which was paid for her; and, both for her fine deep old stamp and "for the man who bred her" (as our friend Easton said, when he showed us The invalid Englishman), Mr. Sharpe holds her in no slight honour. A country gentleman, who bought the old Taglioni coach, said it was worth any money to him just to sit in the coach-house of an afternoon and smoke a cigar over it; but Miss Emily pays better interest than that, as she has had two calves since the sale, and is just calving again. Sunshine, from Mr. Noakes's, is a roughish cow, but a good milker; and we pass on by British Queen, of the Celia tribe, to Bloomer, a relic of the first herd, and a proof that Mr. Sharpe's tastes have quickened with years.

Cleopatra IV. and Daffy Gwynne were both tied up to feed; but they are not destined to follow in the Christmas footsteps of the white (Lady Windsor) and the roan (Clytemnestra) cows of last year. The pair were started off first to Rugby for the All-England prize; and then the white was first, and Lord Spencer's heifer, which had taken first Oakham honours, behind her. Proceeding onwards from the haunt of Mr. Newdegate and his "Conservative Club," the pair tried their fortune at Bingley Hall, where the cards were shuffled, and the roan was first in her class, the white third and Lord Spencer's commended. The judges must have been very sweet on the roan, as they put her before everything in the classes for the *Shorthorn* Cup. Mr. Sharpe was surprised at his good fortune, as, if he had been obliged to decide which he would win with, he would have said the white, which had been to the Royal Cornwall and the Bath and West of England as a store cow, and come home each time with the first rosette. In conformity with this opinion, he had selected her for the Smithfield class, and put the roan among the extra stock. Both were first; but the white was reserved for the cup for the best female in the yard. And so it was at Leeds, where the white met and settled the prize cow at York and Darlington, and the roan was not even mentioned. Their continued successes for nearly three weeks spoke volumes for Richardson's training, as, if they are not very fit when they start (to use Mr. McCombie's expression), "they melt to nothing in the rail." However, when they were both killed at Chesterfield, the roan cut up about three stone the best; and £150 and the medals were their fruits of travel. Many breeders have tried all their lives, and failed to do as much, much less follow it up with a Royal bull first within the next half-year. No wonder that Mr. Sharpe is as fond of *Shorthorns* as Mr. Blenkiron of his thoroughbreds: and in point of enthusiasm, it would be hard to "whip them apart."

The Stable Mead was the home of the prize-takers. Elegant, of the beautiful breast, by Cherry Duke 3rd, from Fuchsia, and bred by Mr. Noakes, was only three in May; and Mr. Wood's Corinne had thus 21 months

the pull over her at Plymouth, where Mr. Stratton's Diadem (3 years 5 months) separated them in the cow class: she had taken a first and two seconds before that; and well she might, as seven cows out of the ten were mentioned at the Royal, and the judges speak of the class as "a very good one, in which we had great difficulty in arriving at a decision." Lilac by Warwick (19120), from Lily of Windsor (another of Mr. Stratton's), has been a fair winner—third at the Royal Cornwall, third at the Bath and West of England, and commended at the Royal. Read second for third, and English Emily, a very thick and snug daughter of Miss Emily, and Englishman had the same public career to boast of. Beyond them, among a field of yearling heifers, we found the first Lord Chancellor calf

that was ever dropped at Courtlands; while Matchless, Stately, the other vestige of the first herd, Lady Ducie, Baby, Countess, &c., had all contributed their quota.

But night was deepening over the Surrey hills; a mist was curling steadily up that long valley to Lewes, past Uckfield, with its Johnny Kenward, and all those brisk hoppers, who thought backing or laying against the duty each Monday in the season far before any horse-racing. Bradshaw was equally inexorable; and through deep lanes, shaded with ash and beeches reddening to the hue of the best fox that ever stood for three hours before Old Tom of the Old Surrey, we reached the Junction once more.

**H. H. D.**

## ON THE WINTER FEEDING OF FARM STOCK.

It is not proposed in the accompanying remarks to advocate high feeding, or recommend to farmers the imitation of gentlemen or amateurs who farm for amusement more than ultimate profit, but simply to review the ordinary methods the rent-paying farmer has at his command, and must have recourse to, for the purpose of bringing his working, breeding, and store stock economically through the winter.

There can be no greater mistake committed by a tenant farmer, whose sole dependence is his farm, and who, consequently, has to pay his rent, taxes, butcher's, baker's and other bills out of its proceeds, than that of imitating too closely the methods of feeding followed out by the wealthy owners of prize animals, whether horses, cattle or sheep.

Full feeding is an admirable thing, and, when confined to the varied articles of food grown on the farm, can scarcely be carried too far: the more grown and consumed, the return in hard cash, of course, also becomes greater; and the manure-heap, the primary source of all agricultural wealth, increases in like proportion.

But when a working farmer, who has really a taste for his business, and an eye for not only a useful but really a handsome beast (a gift which many of them possess) begins—for the sake of having the nicest and best-managed, and best-looking stock in the neighbourhood—to spend large sums on purchased food, he gets into a dangerous position.

Although not generally admitted to be a fact, it is not the less so, viz., that it is quite possible to feed all descriptions of farm stock beyond the paying point; or, in other words, they may be made to consume such a quantity of expensive food that the margin will not only be on the wrong side, but a considerable way down. A case in exact illustration of this point came under our observation a few years ago. A tenant-farmer of active and industrious habits, having a capital knowledge of cattle and their management, and his devotion to his business approaching almost to enthusiasm, changed his system, which was a six-course one, and, in accordance with what was thought, in the face of declining corn prices, to be the requirement of the times, grew less corn, throwing a considerable portion of the arable extent of his farm into permanent pasture. For the purpose of stocking this increase of pasture, he purchased twenty-two milch cows, all picked animals, as nearly even as possible, and the very best of their sort that money could procure. He took great pride in his dairy stock, and justly, as they were beautiful animals, and the admiration of the entire district. Anxious to keep up the good character he had so worthily earned, he overdid the feeding, and spent large sums on purchased food, principally oilcake and bean-meal. To such an extent was this carried that, even under the best management, and an excellent market for its produce, the dairy never paid itself, and had to be given up after a three years' trial, the owner, although in easy circumstances, not being able to stand a yearly loss, or, what was equivalent, to keep a stock whose expenses were equal to the amount realized from their produce. A small flock of ewes now occupy the pastures previously devoted to the cows, equally select in their own way as the cows were; but, profiting by experience, they are allowed to

find their food exclusively on the farm, and, with the present prices for wool, lamb, and mutton, yield a handsome return for their keep.

Rapecake is about as economical a purchased food as can be used on a farm; and yet it is very questionable, when used for anything else but fattening stock, whether it ultimately pays.

There are, undoubtedly, occasions when it becomes almost a necessity to use a little cake, and when, in its own way, it is highly useful. Dairy cows eat it with avidity; and it is an excellent thing for a short period after calving, or at a time when, being fed on mangolds or other watery food, the milk may be a little thin. Both rape and linseed cake enrich such milk wonderfully; but it is difficult to suppose that the extra produce would pay for its continuance throughout the year, unless under extremely favourable circumstances.

Both experiment and analysis agree in giving to rapecake as much value, as a food, or nearly so, as linseed cake, although so much cheaper; and for cattle it is (of late years) pretty much used. Suppose, then, that 6lbs. of rapecake are given daily to a milch cow (less cannot reasonably be given), an expenditure of 4½d. per day is involved. Scarcely, indeed, can rapecake fit for cattle-feeding ever be bought for £7 a ton: 4½d. a-day for the greater part of the milking season—say, 280 days—amounts to 5 guineas—a very large sum to have to deduct from the cows' produce, and hand over to the cake dealer.

Even sheep—the kind of stock that of all others have been paying best in this country for some years past, and that are called by the Swedes "the animals with golden feet, on account of the tendency they have to enrich not only their owners but the land on which they feed"—will not, by any means, pay for an unlimited supply of concentrated food.

A pound of crushed oats given to each ewe daily when nursing, is an excellent addition to their other food; and they will, in a wonderfully short space of time, show its good effect by improved condition of both ewe and lamb.

A like quantity of corn or cake given to fattening sheep is also a vast improvement, enriching the manure and consequently the land on which they are fed, besides hastening the fattening process considerably. So universally is this known and acted upon that sheep are seldom attempted to be fattened without receiving a moderate quantity of crushed corn or cake. When, however, large quantities are given, the benefit derived therefrom is in a great measure lost—the improvement effected on the animals being utterly unable to meet the extra expense incurred, and at the same time leave a moderate margin for the hay and turnips consumed, and also to pay for attendance, nets, and other charges unavoidable when sheep are confined on turnips.

The present season is somewhat of an anomalous one, as the amount of available food at the command of the stock-owner varies very considerably in the three kingdoms.

In England there are districts where food in the shape of hay, straw, turnips, and mangolds is abundant, and where the difficulty is not to procure food for the cattle, but cattle to consume the food. This unusual difficulty is of course caused



by the critical state of the cattle trade, occasioned by the presence of the plague or rinderpest, as it is variously designated.

In some of the English counties turnips are nearly as bad a crop as they were in 1864, this result having been occasioned by the dry weather of June; in others by the ravages of swarms of flies, which ate up every green leaf the moment almost it made its appearance; sometimes even destroying the crop after it had been considerably advanced, and when to all appearance it was beyond the power of such puny-looking enemies to destroy or even injure it. In such districts the available food must of course be used with discretion and economy to bring the stock on the farms on in health to next year's grass, as there is no prospect for some time to come of being able to profitably lighten the stock of cattle, particularly with the view of lessening consumption. In ordinary years this could always be done, and a farmer could without either trouble or difficulty lessen or increase his stock according to the quantity of food he had on hand. At present, in England or Scotland, any one attempting to remove store cattle for the purpose of sale from his farm, or purchasing such even in the districts where fairs and markets are still permitted to be held, would be looked upon by his neighbours as one who had lost all interest in his own affairs.

In Scotland green crops are not quite of such a varied character as they are in England; but still there are districts where turnips are very indifferent, the damage in the early part of the season having been caused by dry-rot, tail-worm, and finger-and-toe. In by far the larger portion of the country, however, turnips are a good crop; in some particular portions they are even extraordinary good. Fodder is also abundant—too much so almost for those who have it to sell, and who grew crops of hay, &c., for the express purpose of supplying the owners of town dairies with winter fodder for their cattle.

The extreme virulence of the cattle plague, in clearing out nearly every animal where it has shown itself, particularly in the town dairies, has cut off a great source of demand; and farmers, who calculated on large and remunerative prices for hay, straw, turnips, and middling-sized and small potatoes (the latter largely used by the town cow-feeders), can neither find a profitable market for their produce, nor yet dare they venture to buy cattle to consume it.

Glasgow, the great centre for the farmers of the West of Scotland disposing of their produce, has suffered severely, and the price of fodder is in consequence extremely low. During the past three months it has become an admitted fact, by every one directly or indirectly connected with the cattle trade, that no animal could be considered free from infection that had passed through Glasgow, and the immense mortality that has occurred in that city would almost make it appear that such theory was established on a sound basis. It is currently supposed that up to the present the Glasgow cow-feeder, of world-wide fame, has lost 800 of his cows. Such a loss, although an excessive one, and in these kingdoms probably unprecedented, occurring to a wealthy man, is only a loss of so much capital, while many a struggling and hard-working man, who kept himself and his family respectably, and paid at all times 20s. in the pound, has been irretrievably ruined by the loss from his stock of from twenty-five to forty or fifty cows.

Although not exactly connected with the subject, it may be noticed that, even in a locality that has suffered so much, and where it was highly dangerous to have anything whatsoever to do with travelled cattle, there has not been wanting various parties disposed to speculate on the purchase of extensive lots, principally West Highland and North Country. Irish, although coming from a country that has as yet not shown the slightest manifestation of disease, being especially eschewed. Whether it is that the latter, from being knocked about when on board ship, or from lying in the lairs about Glasgow, perhaps previously occupied by infected animals, are really more susceptible of disease, it is hard to say; but certain it is, Irish store cattle are at present almost unsaleable in the West of Scotland.

Several lots of three-year-old Highland Scots and Queys, and also of six-quarters old of the same breed, were purchased at the Falkirk October tryst, for the express and avowed purpose of speculation, grass being taken in the neighbourhood at high rates to place them on. Should these lots, in sporting phraseology, "run lucky," they will pay splendidly, the heavier beasts being bought at an easy two-thirds of their ordinary

value, and the younger animals at very little over half, their previous owners being delighted to get them off their hands, even at such a sacrifice.

In Ireland, during the present season the food prospect is anything but a cheering one, the turnip crop being, unless a very occasional fields, absolutely nowhere. The cause of the failure of this valuable crop, in a country the climate of which is so well suited to its growth as Ireland, was the extreme dry and arid character of the month of June. May was a delightful month, and the land was got well-worked and the seed sown when the soil was in splendid condition for its reception; but the dry weather set in before the young plants had got hold of the dung, and between the attacks of the turnip beetle and the scorching rays of the sun they were literally exterminated. They were in the majority of cases re-sown; in some instances again and again; and, although eventually stimulated by the excessive rain-fall, they did not start into luxuriant growth: it was too late to form bulbs of much consequence, and by the beginning of October the leaves were decidedly the leading feature of the turnip fields. Hay is plentiful and cheap, however, although not always of the best quality, on account of the difficulty experienced in saving it during the exceedingly wet months of July and August.

The difference of the weather between Ireland and Scotland and some of the northern counties of England during the past summer has been very marked. While in Scotland they had nice showers in June—just sufficient to start the turnip, and force them beyond the reach of the fly, in Ireland they had not a single shower; and, again, while in the latter country farmers were at their wits' end to get their hay saved, and could not do so for drenching rain, in Scotland they were rejoicing at the excellent season they had for their hay, many of them getting it cut and saved without a shower.

Cattle in Ireland are at present abundant; and, thanks to God's blessing on the precautions that have been taken to exclude it, as yet no sign of the cattle plague through its least and breadth. Should this dreadful disease abate in England and Scotland without visiting Ireland, the Irish farmer has the prospect of finding an excellent market for his surplus stock in the two sister countries, providing he can bring them round until the period of stocking the pastures arrive, in good saleable condition. This he will in all probability have more trouble in doing than either the English or Scotch farmer, for reasons already shown; but yet he has the advantage of a fine soil and genial climate, which does wonders for him, enabling him to try many expedients almost unknown to the others. His great advantage, however, over them is his being able, through the mildness of the climate, to shorten the winter by cutting off a bit at both ends.

The last half of January, February, March, and first fortnight of April constitutes the trying period of the Irish store farmer. As will be hereafter shown, when coming more particularly to speak of the winter feeding of stock, the Irish stockholder has the immense advantage of being able to feed his cattle night and day in the fields, for at least a couple of months after they have been housed across the Channel, and that without the slightest injury or danger to their health, but if the grass has been left anything rough, to their manifest improvement.

Ireland is not called the Emerald or Green Isle without excellent reason. Her proximity to the Atlantic exercises a powerful influence on her climate, which seldom rises or falls to the extreme either of heat or cold. No doubt the rainfall is in the extreme, in the south or west, but this is beneficial to the farmer, as it nourishes and promotes the growth of grass through pretty nearly the entire winter. While in Scotland frost so hard as to stop the plough has on several mornings been already experienced, there has been in Ireland little more than frosty dews, and in all likelihood the plough may not be stopped half-a-dozen mornings by frost during the winter, while in the more northern country it may be stopped as many weeks. Such a marked difference in the climate of two adjoining countries must to a considerable extent render necessary different details of management, which difference will be noticed and compared, as we go on to particularise the different modes of winter management carried out in various localities in the three kingdoms.

It will be nearly always found on intimate acquaintance with the habits and customs of a locality, that where there is any

marked deviation from the established rule and custom of other districts, there is generally a sound reason for such difference, whether the difference consists in the management of live-stock, or the rotation followed out in the cultivation of the land. It does well, therefore, for any man, whatever his experience or skill, when changing his farm, whether it be to a neighbouring country, or even country or district of a county, to study well the modes of management of men already localized, before introducing what are sometimes in the commencement called "sweeping reforms," but which in the end often prove disastrous to the party introducing them.

To carry the point still further, and to bring it down still more closely to daily life, the large and wealthy farmer will, if observant, and not above taking a hint from a person beneath him in position, often see many things in the practice and economical management of his humbler neighbours well worth imitation. Necessity being the mother of invention, the man of limited means is compelled to try every conceivable plan that will, in the working of his land, save labour, and consequently expense; and in the management of his stock every plan must be tried that will save food; and yet not stint the animals, and throw them back in their growth and produce.

The farmer in easy circumstances not being goaded by the spur of necessity, does not so readily hit upon improved systems, nor is he generally so fertile in expedient; but he is not his own friend, when he is above adopting the systems of more humble men, when they are founded on reason and common sense.

It is a question often asked why Englishmen, taking land in Ireland, fail so frequently in establishing themselves? and the blame is often attributed to the grasping character of the Irish landlord and his agent. It will, however, be most frequently found that laying out their available capital too suddenly on improvements that the state of the land and the amount of their capital does not warrant, has more to do with this *marked peculiarity* than any untoward influence exercised by either the landlord or his agent. Landlords in Ireland are like landlords elsewhere; they like a tenant who pays with punctuality (and where is the landlord or agent to be found who does not)? the rent paid, every assistance is given that a reasonable tenant could desire.

A cautious steady man, whether English or Scotch, settling in Ireland, who is not above imitating his neighbour, and who runs into no heavy expenditure in the feeding of his stock until he has felt his way, scarcely ever fails to succeed.

This *en passant*. We now proceed briefly to review the most economical modes of winter feeding pursued by successful farmers throughout the kingdom; this, as stated at the outset, being the principal object of the present paper.

In wintering every description of stock, farmers living in a district where coals are plentiful, and consequently cheap, possess a most decided advantage. Not only is a painful of warm food a grateful and nourishing meal to the animal itself; but it is on the score of economy a decidedly excellent thing for the pocket of the farmer. Cheap fuel enables him to utilize every portion of his chaff and light grain, which otherwise would, in all probability, be thrown out on the dung-heap. In the neighbourhood of large collieries, the screenings can be bought as low as a penny per cwt., which screenings are, for the farmer's purpose, quite as good as the round coal, if not perhaps better.

A mixture of boiled turnips, bean, or other chaff, and light corn, with the addition of a small quantity of bean-meal, given lukewarm, and in a semi-liquid state, forms probably the best and most economical food that could be given to a newly-calved cow. The produce from such food is large, and of excellent quality; and in the middle of winter, when butter produced from the milk of cows fed on raw turnips is execrable, the butter made from such food as this is of the very best quality.

This forms the favourite food of the Scotch cow-keeper, whether in town or country; and as early as the beginning of October, the milking stock are housed at night, and receive a portion of boiled food morning and evening.

Potatoes given raw, after being passed through the turnip-machine, are also very largely used, and are very productive of rich milk. In such a season as the present, when potatoes in that country are a splendid crop, and the price extremely low, the small, middling and slightly diseased portion of the crop

enters largely into consumption, and form an excellent and cheap food for dairy stock.

Where the dairy is a large one, the stock of chaff is generally exhausted at a very early period of the season. When this is the case, chopped hay or straw, but principally the former, is used in the boiler along with the turnips, and forms an excellent substitute.

Young cattle are mostly wintered in yards, on straw, and a few turnips when they can be spared. For this purpose there is invariably a yard, surrounded with a shed attached to the farm standing. The Scotch house their cattle in winter probably to a much greater extent than is done in either England or Ireland.

In the latter country, particularly, a very great contrast is presented when compared with the practice of the Scotch. Large herds of cattle in the very best districts are wintered in the fields, and never enter a house, yard, or shed during the winter. Their owners—many of them wealthy, and most of them in comfortable circumstances, never think of providing house-room for them, declaring that there is not the slightest necessity for it, as the animals enjoy better health, and in the case of milk cows have a healthier and better calf, and the premature births much fewer than is generally the case when the animals are confined to warm houses during the period of gestation.

Where the number is large, the pastures will not, of course, support them in good condition without the aid of other food. The most convenient, and of course the only available food in districts mostly in grass, is hay, which is just given on the pastures. Once or twice a day, according to circumstances, the load of hay is brought into the field amongst the cattle, and the man proceeds to throw it off while the horse moves on slowly.

To men unaccustomed to such a style of feeding, this mode appears most slovenly and wasteful. In practice, however, it is not really so, as the animals lick up every morsel of the hay, and in a short time the field becomes literally covered with manure, or *mocked*, as they say in Co. Limerick. With such a top-dressing, the fields in which this process has been carried on give a most extraordinary crop of hay in the ensuing season. An eccentric but intelligent farmer of the old school, who flourished and made a large fortune in the first Bonaparte's time, used to feed hay to his cattle in no other way than this; and when his men complained in stormy weather that the hay was blowing about the fields, invariably gave them for answer, "As long as it is not blowing out of my fields, go you on with your business—the cattle can follow it."

Although not now considered in most districts in these kingdoms good management to keep cattle in the field day and night during the whole year, yet it is perfectly astonishing how well they thrive when they have enough to eat, and how healthy they are when so kept. Pure Shorthorns, that by many persons are considered so delicate that they would wither and die if exposed to the inclemency of even an Irish winter, are often turned out to seek their food as they best may, without getting the slightest assistance in the shape of hay or turnips, and for the very purpose of bringing them into a healthy breeding state. Prize animals that have been all their lives pampered and fattened up to such a state of obesity as that they refused to breed, are often brought round to become useful breeding animals by this course of treatment, when every other plan had failed.

On a recent visit to the neighbourhood of the Blackwater, paid to a friend farming about 350 acres, we remarked the excessively small quantity of turnips grown on such an extensive farm, the dairy stock alone amounting to close on 80 cows. "Do you see," said our friend, "these fields covered with grass almost fit to mow, and these racks of hay cropping out in our view on different points of the farm? These are my principal dependence for the coming winter for my 80 dairy cows, and a corresponding number of young stock. I have a few acres of turnips and mangolds to give any of the cows that may happen to calve early; but were I to grow these crops extensively, ruin would stare me in the face. My dairy is a summer one, the cows three-quarter bred Shorthorns; and although in the fields night and day during the entire winter, they will come to the calving in blooming condition, and probably I will not lose a single calf by abortion."

This is the experience of an Irish rent-paying farmer, as detailed to the writer, on his own fields, delivered in the

broad, easy *patois* of the district, by a fine, comfortable, almost noble-looking man, born on the land, which he held from an Irish landlord (whom, by the bye, he described as one whom to know was to love), and under whom his father and grandfather held the land before him.

This mode of treatment is eminently suitable for young cattle, as they thrive, grow, and even fatten on the pastures, when supplied with hay and a few turnips, thrown on the grass, when often animals of the same age, fed inside, and supplied with a liberal amount of good food, will keep obstinately thin.

At the spring fairs, when cattle are being bought up for stocking the pastures, it is a noticeable and well-known fact that the animals which have been out-fed during winter are the most eagerly sought for and first bought up; and those beasts that show by their sleek and shining sides, destitute of every particle of old hair, that they have been housed and well cared for during the winter, are frequently not bought at all, or are expected to be got at an easier figure, if they happen to be shown for sale at an early period of the season.

Sheep also thrive remarkably well on the pastures during winter, when they have not been eaten too bare during the summer. Where breeding ewes are kept to a moderate extent, it is an excellent plan to leave a portion of the pastures rough, and preserve it especially for the ewes when nursing.

A ewe will give more milk by far, and rear a better lamb in consequence, when she has a fair bite of grass, along with a few turnips, mangolds, oats, or other food, than she would do had she almost an unlimited supply of the roots and corn without the grass. The bite of grass seems to assist the secretion of the milk, while the other foods would appear more to strengthen her own body and lay on fat. Every one knows, who has anything to do with a flock of breeding ewes, that the worst lambs are invariably with the fattest mothers, while a wretched-looking mother will often have the best lamb in the whole flock.

Store sheep, if many of them are on a pasture, are all the better for having a few turnips scattered amongst them daily during the winter; and a few racks, kept constantly supplied with hay, will tell well in improved condition, and greater size than they could ever have attained to had they been depending solely on the grass for a subsistence.

The greatest mistake that could possibly be committed with regard to sheep has been fashionable of late years, and, being still encouraged at the shows, is likely to be perpetuated for some time to come. The mistake alluded to is the pampering of the rams. Such animals, when bought by ordinary farmers at high prices, for the improvement of, it may be, a small flock of sheep, lead in many instances to nothing but disappointment. When put to the ewes, he is not able to follow them about, and, in attempting to do so is almost sure to get knocked up in his feet, and probably useless for the season. Where he does succeed in tugging the ewes, many miss, and those which breed have often puny lambs. The ram himself, not generally getting the same treatment in his new quarters, often pines and dies during the first winter.

A grass-fed ram, equally well-bred, although not selling at half the price, is usually, from his performance, just worth double, as he is active and lively, and can follow the ewes about without the slightest trouble.

It is high time, in this age of enlightenment, that all this gorging and trimming of animals, for the sake of making them seem what they really are not, was done away with, and the animals shown only in comfortable, healthy condition. Humanity, if not self-interest, would almost dictate such a course.

Pigs at this period, when the country is in such a state of alarm about the cattle plague, are attracting a more than usual share of attention. It is questionable whether swine pay for crops grown expressly for their use; but whether the fattening of them leaves a fair return or otherwise, pigs can always be made to pay well in the yard of the industrious farmer. There is probably no domestic animal so easily kept as a sow. A half-rotten turnip or mangold, a few grains of corn gleaned at the barn door will do for her for the day; and if, in addition to what she can forage for herself, she gets a drink of whey or butter-milk once a day, she will keep herself in excellent condition.

In many parts of the country, young pigs are now bringing 15s. each at a month old, and bargained for before they see the light. With such prices, there is ample encouragement for every farmer to keep a few well-bred sows, as the revenue derivable from them is singularly sure and regular, and the sows themselves (except during the month they are nursing) feeding almost only on what without their presence would be absolutely lost. Fattening bacon hogs is quite a different trade from this, requiring more skill and capital; and the price of fat pork and bacon being so fluctuating, the profits are much more uncertain.

There is still another description of farm stock to be noticed, and that a most important and often expensive one—the working horses. Good treatment and a liberal allowance of food is well repaid on the horse—by increasing his strength and activity, and thereby his usefulness. There is no more distressing sight, nor one more indicative of bad management or straitened circumstances, than miserable farm horses, requiring to be urged at every step by whip or rein. It is much better to have one pair of well-fed, smart-stepping horses, able and willing to do their work, than two pair badly fed and badly cared.

At the same time, it must be observed that there is scarcely another variety of farm stock requiring such economical management as the horse. If fed too liberally for the amount of work he has to perform, there is a loss to his owner—a loss, too, that cannot be regained, as it is by his work alone that he can re-imburse himself for his feeding. Hay and oats are the articles of food of all others most suitable for the horse; but the farmer must look about for some less expensive articles of diet to feed his horses on, or at least to substitute for a portion of them.

In Scotland and England, where the horse is better cared for than perhaps in any other country in the world, he is taken off the grass about the end of September or beginning of October, and housed, boiled food, consisting of turnips, chaff, and a few beans, being given to him morning and evening. On this food, he keeps in first-class condition and is remarkably healthy, unless he is given the boiled food in excessive quantity, when he is subject to gripes, which often proves fatal. A little corn is given twice a-day, and the racks are filled during the winter with bean or oat straw; hay, however, taking their place as the days lengthen, and the work gets continued and heavy.

In Ireland the farm-horse has to suffer infinitely more hardships, being hard-worked, and often badly housed and fed. They are much longer in being taken from the grass than in the two sister countries, it being often the middle of November before they are stabled. Hay, oats, carrots, potatoes and bran, and sometimes boiled barley, constitute the principal articles of diet when inside, during the winter months. Boiling food for them on the extensive scale that is practised in Scotland is never attempted, on account of the dearth of fuel.

There is, however, a food peculiar to itself coming greatly into repute of late years for horse feeding, and that is furze, variously called gorse or whins. Its good feeding qualities have been made known, principally through the exertions of the Rev. Mr. Townsend, Rector of Aghada, who has been using it for both horses and cattle for many years. It forms a very nutritious and palatable diet, and there is no other crop at present known to the agriculturist that will feed as many head of cattle to the acre as furze. Without going quite the length Mr. Townsend recommends, no farmer would do wrong in sowing an acre or two near his homestead for his horses: they eat it greedily, and with apparent relish; and it materially lessens the consumption of hay during the winter months.

It is sometimes recommended to sow it on poor land, but it is idle to do so, as one acre of good land in prime manurial condition will grow as much as five or six acres of poor land will do. It is not objectionable near the steading or farmhouse, as the rich dark green of the young shoots is rather ornamental than otherwise, and its being grown near the stables is a great convenience, on account of a daily supply being required. A.

## HARVESTING CORN AND DISPOSAL OF THE CROP.

At the last monthly meeting of the Winfrith Farmers' Club, Mr. CHAPMAN SAUNDERS said: In introducing this subject—one which I think you will agree with me is of a very practical nature—I am reminded of the impossibility of laying before you one system, or propounding a theory, suitable for each different district, with its variation of climate, soil, and many other circumstances peculiar to locality; difficulties only to be overcome by individual energy, skill, and foresight of the practical agriculturist, assisted by a knowledge of the peculiarities of the locality in which his lot is cast. It is, therefore, my intention to make these remarks of as general a character as possible. Harvesting, or the method of securing the crop, is governed by many circumstances, amongst which may be enumerated the situation of the land, its relative position to that of the farm-buildings, the supply of labour (horse-power and manual), and the difference of seasons. In securing wheat, the most important of our cereals, the methods of cutting which I shall notice, and which are now almost the only ones at least in practice in our own county, are mowing, reaping, and cutting by machine. Mowing, or cutting with the scythe, may be performed in two ways; the more common method, but at the same time I may add the most untidy of any, is that of laying the corn out in swathe at once ready for the binder. This, although the least expensive method of cutting by hand, is attended by certain disadvantages, some of which I may notice. First, the untidiness of the sheaves, when bound up, owing to the corn in the swathe being laid in a slanting direction instead of at right angles; consequently the butt ends of the sheaves are uneven when they leave the hands of the binder, and thus, when set up in the field, have not a firm footing. By this method also there are often ears of corn in the tails of the sheaves, which remaining in the field some length of time, and the weather perhaps unfavourable, may become sprouted, or at least be carried to the stack in an unhealthy condition; besides this there is always a larger quantity of "rakings" left over the field than by other means, and this being allowed to remain exposed to the weather until the sheaves are carted, and sometimes the greater portion of other crops, is of less value than that which has been secured earlier. Raked corn is not only of inferior quality, but very frequently has particles of soil mixed up with it, collected with the straw, thus rendering it fit only for seed purposes, or to grind as food for cattle, pigs, &c. On the other hand, mowing may be resorted to where corn ripens all at the same time, when there is a scarcity of labour, and where the reaping-machine is unavailable, as the only means by which to make progress in a short and seasonable period. I consider sheaves of mown corn become fit for carting earlier than those which have been cut with the hook; on account of their being looser they admit more air through them in the field, and likewise in the stack, as the corn when placed there might not have been in first-rate condition. The other method of cutting with the scythe is that of throwing the corn when cut against the standing corn. In this case the mower must of necessity be followed immediately by a gatherer, to remove the corn and place it in sheafs. On the manner in which this operation of gathering away is performed depends much the quality of the work, as the loose ears which remain often become entangled round the scythe which follows, and may be the cause of some delay, in addition to the inferior work done. Having carried this system into practice several seasons when the corn has not been adapted for cutting by machine, I can strongly recommend it. The work being well performed is nearly if not quite equal to that of the hook; it is also more expeditious and less costly, besides it is a method by which an ordinarily mixed staff of labourers on the farms, many of whom might make inferior and bad work if placed to reap, can each find his proper place. An able man requires one about equal in strength to follow him, whilst an older man will only require a strong lad, and so in proportion—a woman or lad as available being engaged to tie after each scythe. I generally place them according to families as much as possible, for the better division of their earnings—two scythes, two gatherers, two tyers, and if there is a small boy

in the family he throws the sheaves together. This forms a company, who work at piece-work, the price paid being 6s. per acre, besides ale or cider, with the usual extras as when by day-work. Where corn is laid badly I prefer this method even to using the hook. Reaping, or what is more commonly termed "yawing," is, when taken altogether, about the cleanest mode, but it costs at any rate 2s. or 2s. 6d. per acre more than the one last named. But on level land, and good standing corn, with a fair crop, no kind of work can surpass that of the reaping machine, that is when circumstances favour—viz., moderately level land, fair size ridges, free from large stones, standing corn, where cutting can be followed on every side of the field, and I have frequently found less rakings after it per acre than from any other method. Another reason why the reaping machine is to be recommended is that at the commencement of the harvest season horse-power may be employed in cutting, when otherwise it would be of no value just at that immediate time, all manual labour being directed to tying, &c., after. A close stubble is desirable under general circumstances, for the value of the straw gained and the better carrying out of autumn cultivation. An exception may be made where the land is sown down with seed, and intended as an outlet for sheep during the autumn; and, besides having your stock deprived of a certain amount of food cut off with the straw, there arises the necessity of allowing the crop to remain on the field several days longer, at all risks, before it becomes fit for carting. I consider it advisable to tie oats as well as wheat, if possible, as the expenses afterwards are reduced by so doing. Barley is seldom tied into sheaf in our county, and perhaps for sufficient reason; but in the midland and northern counties loose barley forms the exception rather than the rule, nearly all being tied. In Scotland I found not only the bulk of the wheat, barley, and oats tied, but the rakings also. There it becomes, perhaps, more a matter of necessity, as harvest work does not commence until some few weeks later than with us, and consequently there is more dew and a different atmosphere altogether. The barley is tied with a double bond, stitched and secured from the weather by two sheaves meeting each other over the centre of the stitch, the ears downwards over each end of it, which must serve as a good protection in a late season. In a general way sheaves of all kinds should be small, and the stitch or shock, consisting of from five to eight on each side, should be made by commencing in what is to form the middle, as by this course the sheaves lean towards the centre and stand better afterwards; each sheaf should be placed or rather struck on the ground in a slanting position (not upright and made leaning afterwards), and should meet directly the sheaf on the opposite side, so that each one may help to support the other. A very secure method for sheaved wheat, though not often practised or necessary, is that of cap-stitching, performed by first placing a sheaf on the ground perpendicularly, then placing others in a leaning position against it to the number say of fifteen or twenty, the object being to produce a round stitch, firm and regularly pointed at the top to receive the cap-sheaf or hood, which is made of two sheaves bound together, or, what is better, a sheaf double the ordinary size bound near the tail tightly. This sheaf is spread from the centre and lifted over the stitch, the ears drawn downward, and the reed straightened; another band round the whole completes the stitch, which is thus secure against all weather, and is a very good practice in small enclosures and in wet seasons, when from heat and moisture corn vegetates quickly, also as a means of securing those kinds of grain with a delicate skin and which consequently sprout freely. In changeable and stormy weather all sheaves should be tied as soon as the corn is cut, whether it be by hand or delivered from the machine, and it should remain standing until it is fit to cut and tie, as thus during unsettled weather it is ready to bind sooner than when flat on the ground. When corn has become what is termed "dead ripe," it is as well (provided there is no grass mixed with the straw) to cut, tie, and stack, in the same day. There are reasons favourable to this practice, which are—first, economy, as the expense of putting the corn into shock is

saved, and also corn which has "overstood" has its ears so crooked down that it is impossible to make a shock secure from wind and weather. In the usual way, that is when a few days are allowed between cutting and carting, I consider mown corn tied into sheaf may sometimes be fit to stack before that which has been reaped; owing to its being looser and more open in the straw more air is admitted through it in the field and also in the stack, an advantage when it has been put together not in a very first-rate condition. On the other hand, sheaves that have been reaped settle down closer together when carted, producing a much firmer stack, and better adapted for the purpose of being shorn after the harvest work has been completed; also its appearance is somewhat neater. A well-made and firm rick is desirable where rats exist in any quantity, as I have found it to be a sufficient guard against any number of them when properly constructed and shorn before any of these vermin have made their holes into or under it. Whether the rick is constructed on a saddle or on the ground is of little consequence when treated in a proper manner, as far as rats and mice are concerned. The trimming should be performed somewhat after this manner. From the eave (which every stack of sheaved corn should have, to carry the rain falling on the roof away from the sides) downwards, to within about four or five feet from the ground, the uneven ends of the sheaves on the outside may be cut off sufficient to give a neat appearance, with a long blade fixed in a long handle for the special purpose, or a scythe partly worn with the point taken off will answer nearly as well. The remaining, or bottom part, has to be shorn with an ordinary cutting-knife, taking away sufficient, it may be nearly to the bond of the bottom sheaves, also the bedding beneath, consistent with giving this under part that closeness of the reed and hardness which, being thus obtained, no rat can penetrate, and, from the small base on which the stack is thus made to rest, the angle on the outside is such that if a rat jumps against the side it is unable to hold its position, but falls to the ground from whence it sprang. The method is very effectual and also practicable, as I have found stacks so treated within a short distance of immense numbers of these vermin to withstand their attempts successfully a year or even two. This leads me to consider the best position for the stack, whether placed in the field or at the homestead, and this must depend on the value placed upon the straw, distance from the steading, state of the farm roads, horse power, &c. At the time of harvest, when the stacks are being made, the selection of a proper spot for each leads to the inquiry when and in what manner are they to be thrashed out, and the use to which the straw will most probably be applied? I say probably, because it sometimes happens that the straw, in its nature best suited for feeding, has been exposed to the weather, so that it may ultimately cause some deviation in the course pursued from that first intended; therefore I would say, first secure for your cattle the straw intended for them, unless it is impracticable to do so from more weighty considerations, it may be, as regards the grain within. The stack, if intended for removal to a barn, should be placed as near as possible to it at harvest-time, for obvious reasons; it is better to do so at that season than in winter, or when its removal becomes necessary, at which latter period more horses are frequently required to cart home than would be the case at harvest. There is yet another and equally important point to be considered. When the day for removal (say in winter) has arrived, one should be chosen with a clear atmosphere, free from vapour, following others of a like favourable nature; but sometimes necessity from existing circumstances will not permit the awaiting of such season; then is the advantage of having a stack situated conveniently near the barn highly to be valued. Again, a clear winter's morning is not always followed by a fine day, and the work of removal having commenced—a storm overtaking loads by the way—the greater the distance the loads have to travel the more injury to them results in consequence. Even in such case, if no rain actually falls, a lengthened exposure to the atmosphere tends to give the grain a damp condition. I do not object to making stacks in the field when it is to be thrashed by steam; but the spot selected should be adjacent to a good road, so as to enable the corn and straw to be drawn separately to the homestead if required. Thrashing, whether conducted in the field or in the barn, has each its own proper season, and should be carried on with greater regard to atmos-

pheric influences than is frequently observed. It may be prosecuted away from the barn in the open air during the summer months when fine weather prevails, and thus the corn may derive much benefit from the sun's rays or a drying wind; but I consider that during the two last and two first months in the year, viz., November, December, January, and February, it is preferable in most cases to transfer the greater portion to the barn; an exception may occasionally be made, such as during frosty weather. It is in some measure due to the carrying on of out-door thrashing by steam power at all seasons of the year, as pursued by many, that complaints from factors and millers are sometimes made of the condition of the grain offered in the market during the winter season; when it is sometimes scarcely fit to be ground up at once, still less suited for storing away any length of time, or for shipment. This fact should not be forgotten by those who assert from the want of being more practically informed, that barns are unnecessary to a farm under present circumstances. The benefit derived from having, not one barn only, but several on most farms, is decidedly worth consideration. It is preferable to have two barns of moderate size rather than one large one, for the purpose as much as possible of keeping the different kinds of grain separate, as well as the better disposal of the straw. When the farm is large and hilly, as many are in this neighbourhood, a barn with a shedding attached is very advantageous for the purpose of consuming a certain quantity of straw by cattle near where it is grown, in which case the manure is more easily returned, thereby reducing the expenses of the farm. Another barn may be allotted to wheat, either filled with sheaves at harvest time, but I consider better suited for the purpose of putting the rakings into as they are collected at different times. The system of mixing loose rakings with sheaves, as occasionally practised, is a very untidy one, in favour of which few arguments can be advanced. Thrashing in the barn by horse-power during the winter, although considered by some a slow and tedious process as steam becomes general, has certain advantages, one of which is economy; by that I refer to the disposal of the straw and to the cost of labour. On some farms, where the number of labourers employed is limited, there is a difficulty and likewise an inconvenience experienced in collecting a sufficient number of people to keep a steam thrashing machine employed, independent of carters and ploughmen, when the teams or some portion have to remain idle. This does not apply in the same degree to horse-power machines, which require a less number, and the individual strength required is not so great. I would further add, for reasons before stated, I consider it more preferable on small farms to keep a horse-power machine than to hire one of steam. Whether on large or small farms, there are certain times in the winter when both people and horses are unable to do much on the land, or perhaps there is not much at such times which can be found for them to do; these may be employed at the shortest notice, where there is a horse-power machine kept ready fixed at a certain barn, which might be allotted for the particular use where there is a sufficient number. I do not advocate thrashing by this means at all seasons, as during warm weather and in summer, when considerable fatigue is felt by the horses, steam is preferable. Water-power is preferable to any other where it can be obtained with certainty at any season, and in all other respects convenient. Having thus briefly noticed the harvesting and thrashing of the crop, I shall proceed with a few remarks especially on its disposal. In these days, when so large a portion of the grain is thrashed by steam, it is the custom of some who either place but little value on the straw, or from a limited means for consuming it either as fodder or as litter for cattle, to thrash a large portion in the field where grown, distributing the straw carelessly over the land as muck, not knowing how to dispose of it better, or perhaps allowing it almost to waste away in heaps. It would I think be much better, especially on land at a high elevation or of a cold and tenacious nature, to form a sort of wall, say six feet thick and ten feet high, enclosing a sort of yard, and in this way to receive the refuse straw thrown over it, which would be very serviceable in severe weather for sheep to lie upon. This system is, however, one of great waste, and which is to be recommended only in few instances. Straw may be better disposed of, where the distance from the homestead is great, by placing the stack at harvest-time near a good piece of roots, and making a temporary yard with

sheltered hurdles, with a few poles and small posts, to construct a light roof; such place thus put up where two or three fields meet might answer the purpose for two or three successive years with slight repair. The stock would derive much benefit from being driven thither for the night, and the land being of an average kind, with oats or barley to follow, would not be much the worse from a portion of manure being thus taken away. Such a course is certainly preferable to carting the straw and roots home and bringing back the manure. In the immediate vicinity of large towns straw may sometimes be disposed of at remunerative prices, in which case it may be advisable to sell and buy in exchange manures of a more concentrated kind. In some seasons no surplus straw exists, as the amount of litter which may be converted varies so much with the weather, to keep animals of whatever kind in a comfortable and thriving condition. Straw as fodder is of more or less value according to the stage of growth at which gathered, that comparatively early cut being much more nutritious than that which has overstood; the quantity of grassy food mixed up with it, and also the state of the weather when carted, should be considered; hence it is advisable where straw is of value to select the best for feeding as far as practicable. Oat straw I consider preferable to wheat or barley, and where little or no pasture and meadow land exists more straw may often be advantageously and profitably consumed in proportion, either in the shape of long straw or as chaff. As far as my own experience has gone, I am of opinion that straw cut into chaff and given in large quantities to sheep does not answer so well as for bullocks; but I have frequently found sheep thrive where they have been able to select what they choose from loose straw thrown out, treading down the remainder. The fresh thrashed is preferable to stale, which being sometimes exposed to atmospheric influence, is not so well relished by animals consuming it; hence the advantage of the flail, by which the corn is thrashed out, and the straw served from day to day to cattle in yards, as also to cart-horses, over that of machine-thrashed, and stacked sometimes weeks and even months before consumed. I prefer giving good straw to cart-horses in their racks rather than hay, which is often found to be very wasteful. Hay if given to cart-horses at all should be as chaff. If the money value of the hay which many horses consume and waste were expended on them in the shape of extra corn with the corn before given, and substituting straw for hay, I have little doubt but the result would prove more economical and better for the animals. Respecting the disposal of the corn, it is not my intention to detain you with any very lengthened remarks. The wheat goes for the most part to feed the people—would, I could add, at present prices, remunerative to the grower; but to this he has quietly to submit by what is a so-called free-trade principle. Barley of the best description, and of which only a limited quantity is grown in this district at least, goes to be converted into malt for brewing, the inferior qualities, together with oats, peas, beans, &c., being made use of for stock-feeding purposes. The inferior barley—by far the larger proportion grown—is thus used as the raw article, prevented as we are by that odious impost, the Malt-tax, from making the best use of what might be a very valuable article in the production of beef and mutton, commanding at present, and in all probability for a long period, very high prices. This is another reason, with others already set forth, why it ought to become a consideration with the greater portion of the community at large to demand the withdrawal altogether of such impost. The great injustice of this tax to the farmer must also be apparent when it is remembered that barley is almost the only raw material of home production subjected to taxation, and so heavy, amounting to 70 per cent. upon the average price of barley; and with free-trade in wheat why should he not have the privilege of free and fair trade in barley? I think it is pretty well proved that there is no class of persons in this country who would bear the remaining of a similar tax as farmers. See what the hop growers and the paper manufacturers and others have done. I would impress on you to agitate and agitate again, as it is only by so doing that we can expect to receive that to which, in these days of free-trade, we are so justly entitled. Do all and in every way in your power to support and strengthen the proceedings of the Central Anti-Malt-tax Association in London, and I have no doubt sooner or later some good must result. Gentlemen, I now leave the

subject, "Harvesting Corn and the Disposal of the Crops," for discussion in your hands, and will only add in conclusion that the comparative difference in cost of cutting by the scythe, the hook, or the machine, and also of thrashing by steam or horse-power, is trifling, the advantage being in the convenience of doing a large amount of work in a seasonable and short space of time and the proper disposal of the straw; but at the same time, a method which may be pursued with the least real expenditure is not always to be chosen for that reason alone.

Mr. UDALL observed that it was now the rage to recommend steam and machinery for every purpose to which they could be applied, and some people were unbending advocates for steam thrashing. It might be very good under certain circumstances; but as regarded Lent corn, and looking at the value of the straw for feeding, he thought the thrashing might be done with the flail cheaper and more advantageously. Now if they hired a machine for a week they would not thrash above 30 quarters a-day; and let them calculate what would be the cost of thrashing those 30 quarters. Besides the hire of the machine they would have to pay the engine-man and stoker, 4s. a-day for the two; a day's consumption of coal, 7 cwt., would come to say 7s.; ten men at 18d. a-day would be 16s.; cost of supplying water say 4s.; and the proportion of fetching the machinery to the farm 2s. 6d., as an average for the day. This would give a total of 32s. 6d. for thrashing 30 quarters, or 1s. 1d. per quarter, to which they must add 10d. per quarter to pay for the hiring of the machine. This would give 1s. 11d. as the cost of thrashing a quarter, while he could get his oats thrashed by hand at 1s. a quarter, and barley at 18d. a quarter. He believed it was thrashed equally clean, or cleaner; the barley was of better quality; and the straw, as well as of oats, was of twice the value for feeding purposes, as it could be provided fresh from day to day as it was required for the stock. Therefore, although they were recommended steam machinery in everything to which it could be applied, in some instances perhaps they were not altogether right in discarding manual labour, though he did not mean to say that under certain circumstances steam was not highly advantageous.

Mr. C. BUDDEN suggested whether it would not make a difference in the comparative cost where they had a small steam-engine of their own, which might otherwise be usefully employed to do anything else they wanted when not required for thrashing, and thus lessen the number of horses kept on the farm. In many places labour was scarce, and it was often difficult to get men when they wanted them, so that then it resolved itself into a question between steam and horse-power.

Mr. READER thought they must be much obliged to Mr. Chapman Saunders for the very able manner in which he had brought the subject forward, the first part of which he had quite exhausted. He was in favour of having a steam-engine of their own, suitable to the farm they occupied, as they were often put to great inconvenience in hiring. With regard to the disposal of the crop, this naturally brought them to the subject of the Malt-tax, which pressed so heavily upon one of the chief products of the soil. Now, when they had to compete with the foreigner, who could make his barley into malt and feed as he pleased, he certainly thought the British agriculturists should be allowed to do the same without any interference on the part of the Excise. No other class in England would have submitted so long to the inconveniences and restrictions experienced by the agriculturists; and if the manufacturers had half as much to complain of as the farmers had, the Malt-tax would have been repealed long ago. Not only did it interfere with the disposal of the crop in the manner that would be most profitable and remunerative; but if they made it into beer for the benefit of those who by their own hands raised the crop, they had to pay a most exorbitant duty to the Government. But it was not only a producer's question, for it was one which affected the consumer very closely, and the man who drank his pot of beer had to pay 100 per cent. upon that commodity, in consequence of the operation of the tax. Then they also heard that the beer now sold often only tended to increase thirst, and produce a maddening intoxicating effect, owing to drugs which were used to give it a fictitious strength; but if the Malt-tax was repealed malt would produce a cheaper beer than they could brew any other way. Thus it was a subject in which the general public were deeply interested, and they ought to join with the agriculturists in agitating for the repeal. As to the Government experiment in regard to feeding upon malt,

it was not conducted in a proper manner, for no one would think of feeding entirely upon malt any more than they would upon sugar; but it would often be highly valuable to add a relish and assist other food, while in itself highly nutritious. But on the fair principles of Free-trade the agriculturist was entitled to the total repeal of a tax which was the only remnant of protection; and the manufacturer ought to assist him in obtaining what was only justice. He trusted the Central Anti-Malt-tax Association would be still more generally supported, and that they would continue to press the question before Parliament until justice was done. He believed that all classes would ultimately reap considerable benefit.

The CHAIRMAN said it was very hard that they should be obliged to produce wheat at Free-trade prices, and yet have their barley so heavily taxed. He could use his wheat where he liked and for what he liked, but if he did so with his

barley he had to pay a tax of sixty or seventy per cent. upon its value. He certainly thought that every farmer should be allowed to use his barley on his own farm in any way he thought fit. With the present high price of meat also he thought the Chancellor of the Exchequer was doing a serious injury to the public by keeping on the Malt-tax, for if the farmer could use his barley as he liked he would be able to produce more meat. They were certainly now offered the chance of maling for feeding purposes, but it was under such restrictions that it could not be done with advantage. If the exciseman had anything to do with it they must give it up. They must, therefore, agitate for the total repeal with increased energy, and never say die till they are dead.

On the motion of Mr. UDALL, seconded by Mr. R. RIXDALL, a vote of thanks was passed to Mr. Saunders for so ably introducing the subject to the meeting; and that gentleman having returned thanks the proceedings terminated.

## THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

**MONTHLY COUNCIL: Wednesday, Nov. 1. —Present:** Lord Tredegar, President, in the Chair; Earl Cathcart, Lord Chesham, Lord Feversham, Lord Walsingham, Major-General the Hon. A. N. Hood, Sir J. V. Shelley, Bart., Sir T. Western, Bart., M.P., Mr. Acland, M.P., Mr. Amos, Mr. Barthropp, Mr. Bowly, Mr. Burgess, Mr. Cantrell, Colonel Challoner, Mr. Clayden, Mr. Dent, M.P., Mr. Druce, Mr. Brandreth Gibbs, Mr. Hamond, Mr. Holland, M.P., Mr. Jonas, Mr. Lawrence, Mr. Pope, Mr. Randall, Mr. Rigden, Mr. Sanday, Mr. R. Smith, Mr. Thompson, Mr. Torr, Mr. Henry Wilson, Mr. Jacob Wilson, Mr. Frere, Professor Simonds, and Dr. Voelcker.

The following new Members were elected:—Atchison, William, 18, Cannon Street, London, E.C. Boulds, Cornelius C., Plymouth  
Bulteel, John, Pamflete, Ivybridge  
Cooper, J. R., Manor House, Barton, Bury St. Edmunds  
Day, Richard, Hodrold Hall, Wakefield  
De Westphalen, Count Olenens, Laer, via Cologne  
Garnier, Charles, M.A., 11, Grove Street, Oxford  
George, Richard, Waterston House, Puddletown, Dorchester  
Huntland, William, Rodley, Westbury-on-Severn  
Houghton, John S., Railway Hotel, Southampton  
Loye, Philip, Kingston Villa, Mannamend, Plymouth  
Lyle, Joseph, Bonython, Helston, Cornwall  
Smith, Roger, Plymouth  
Turnham, George, Barnham, Thetford.

**FINANCES.**—Major-General the Hon. A. N. Hood, Chairman, presented the report, from which it appeared that the Secretary's receipts, during the past three months, had been duly examined by the Committee and by Messrs. Quilter, Ball, and Co., the Society's accountants, and found correct. The balance in the hands of the bankers on the 31st October, was £870 14s. 5d. The quarterly statement of subscriptions and arrears to 30th September and the quarterly cash account were laid on the table. The Committee recommended that the sum of £2,000 be sold out of the funds. This report was adopted.

**JOURNALS.**—Mr. Thompson, Chairman, reported that the prize of £50 for the best Essay on Middle-class Education had been awarded to the paper bearing the motto—"Mind rules Matter." The President having opened the envelope, announced the writer to be Mr. Robert Vallentine, Burcott Lodge Farm, Leighton Buzzard. The papers written by the Rev. Lewis Evans, Sandbach, and the Rev. W. H. Beever, were commended.

**SHOW-YARD CONTRACTS.**—Mr. Torr reported the recommendation of the Committee that the insurance on the Society's plant be increased to £2,000, and that Messrs. Easton and Amos be instructed to insure the machinery belonging to the Society, which is now in their keeping. The Committee considered the details of the preliminary

plan prepared by the Surveyor, under the direction of the Committee, and agreed to the same with some slight modifications. It was determined to construct sleeping places for the herdsmen and shepherds at the end of every alternate row of shedding. The Committee considered the rough plan prepared for the construction of new entrances, and the various offices attached thereto, and agreed to certain alterations. Also the form of specifications for the construction of—1st, the showyard, &c.; 2nd, the erection and removal of the offices and buildings now the property of the Society. The surveyor was directed to prepare corrected plans in accordance with the decision of the Committee, and to make the necessary corrections in the forms of specifications. The Committee directed the above should be printed for delivery to persons intimating their intention to tender, on payment of 10s. each. It was determined that advertisements be inserted in the undermentioned papers, inviting tenders, stating that the plans can be inspected at the Society's office after the 1st Nov.:—*Bell's Messenger*, *Mark Lane Express*, *Gardeners' Chronicle*, *Builder*, *Building News*, and *Midland Counties Herald*. This report was adopted.

**BURY MEETING.**—On the motion of Sir John Shelley, seconded by Major-General the Hon. A. N. Hood, Monday, July 16, 1866, was named for the opening of the Bury meeting.

A letter from the President of the Royal and Imperial Agricultural Society of Vienna was read, announcing their forthcoming Exhibition of Live Stock and Agricultural Machinery on the Prater of Vienna, in May, 1866.

Earl Cathcart, with a view to the due satisfaction of Exhibitors, moved that the following instructions be added to the instructions to the Judges of Implements, viz., "The Judges in the miscellaneous department are instructed to visit every stand of Implements in its numerical order, and to report accordingly, to place on the notice board each evening the number of the Stand with which they will commence their inspection on the following morning, and at 1 o'clock each day the number of the Stand from which they will proceed at 2 o'clock." The motion was seconded by Mr. Thompson, and carried.

On the proposition of Lord Cathcart it was arranged that Professor Voelcker should deliver a lecture at the Society's house, on Tuesday, the 12th December, at 5 P.M., on Disinfectants, in relation to efficiency and cost, including all the more recent chemical discoveries, and having reference to buildings, ships, railway trucks, and generally to the health of live stock, the prevention of infection, and the treatment of infected hides and carrion. The inquiry will not lose sight of the influence of the free use of the several disinfectants as regards the agricultural value of the manure so treated.



## THE GAME LAWS.

At the Social Science Congress a meeting was held of the Section of Agriculture in one of the halls of the School of Arts, Mr. Holland, M.P., presiding.

Mr. GEORGE HOFFE, Fentonham, read the following paper on the subject of the game laws. He said: The game laws consist of numerous Acts of Parliament, which restrict the killing of certain wild animals, denominated game, to particular seasons, and by certain individuals who must also first obtain a licence from Government to enable them to do so. Partridges, pheasants, moorfowl, ptarmigans, heathfowl, snipes, or quails are termed winged game; and hares and rabbits ground game. Deer, I believe, are also game, unless appropriated by enclosure in a park, when they become property, and the taking of them is punishable as theft. Game at large has never been held as property, and these laws, therefore, are only founded on expediency, or rather the strong will of the governing classes. To mitigate some of the acknowledged evils that flow from them, it has been strongly advocated that the law should declare all game to be property, and to belong to the owner of the land on which it is found. But it is impossible to hold animals to be property which cannot be identified, and who can tell the difference betwixt one partridge or one hare from another of the same species, as they fly over or run across the country? besides being animals which may become the property of half-a-dozen different people in a few minutes. The law might declare such animals to be property, and punish the taking of them as theft; but this remedy appears to me more likely to confound the sense of right and wrong, and thus to weaken the security of all other property, than to attain the object intended. Blackstone, in his Commentaries on English Law, observes: "From this root (the forest laws) has sprung a bastard slip, known by the name of the game-laws; both founded upon the same unreasonable notion of permanent property in wild creatures, and both productive of the same tyranny to the commons, but with this difference—that the forest laws established only one mighty hunter throughout the land: the game laws have established a little Nimrod in every manor." The natural right of every man to hunt and kill wild animals was long maintained in the Roman law, and was recognized and acted on in the earlier periods of British history. The right was usurped by the feudal barons, and it has continued to the present day to be essentially an arbitrary privilege of the wealthy and aristocratic classes. In the time of Richard II. it was enacted that no artificer, labourer, priest, or other clerk of small income, "shall have or keep from henceforth any greyhound, hound, or other dog, nor shall use ferrets, nets, &c., to take deer, hares, nor conies, nor other gentlemen's game, upon pain of one year's imprisonment." This law has been repealed, but the same spirit runs through every later enactment: it is at the peril of the lieges if they take or disturb "gentlemen's game." In Scotland, the right of killing game seems to have been enjoyed by the whole population up to a comparatively recent period. It was only in 1821 that the first statute in regard to this matter was passed by the Scotch Parliament. With characteristic brevity, it simply enacted, "That no man hunt or hawk at any time hereafter who hath not a plough of land in heritage, under the pain of one hundred pounds," which sum, being Scots money, amounts to £8 6s. 8d. sterling. This old statute still remains in full force north of the Tweed, and the penalty quoted admits of no modification, but is often added to the other penalties for trespass, and for the want of a licence to crush landless poachers, though no other qualification beyond the licence from Government is required in England. The differences betwixt the law as it exists in both countries, and various anomalies, common to both, must speedily attract the attention of Parliament. At present, almost every newspaper in Scotland is discussing the effect of proposed alterations or modifications of the amendment of these laws, and at least some advocate their total abolition. Even a cursory examination of them will show how vindictive, if not ferocious, the penalties are for any infringement of their enactments. Their effect is also most disastrous on the morals of the labouring class in the

rural districts. Within the last twenty years the convictions under them have increased from 5,000 to upwards of 10,000 in England alone. The losses sustained by tenant farmers from the destruction of their crops by game has long been a cause of just complaint, and it is admitted by every competent judge that high or profitable farming is incompatible with game preserving. I have a strong belief myself that all game laws might be utterly abolished with great advantage to the whole community; and if a more stringent law of trespass was thought necessary, that no special damage was instructed, a penalty not exceeding 40s. might be recoverable like other debts, besides compensation for any damage, even the carrying off of hares or pheasants by wilful trespassers. But I appear here as representing the Scottish Chamber of Agriculture, and I propose simply to advocate the resolutions agreed to by that body, and to show that these laws ought to be modified and amended, so as at least to render them more in harmony with justice and right feeling. There can be no reason for a qualification Act being in force in Scotland when none is required in England. In the latter country a tenant had full right to the game on his land unless he voluntarily divest himself of it in his agreement with the landlord; but in Scotland a tenant cannot hunt or kill game without the special authority of his landlord, however long his lease may be, even though it was renewable for ever. It is even matter of doubt if the owner of an entailed estate can legally grant a lease of the game for a term beyond his own life. On the other hand, proprietors and all authorised by them may hunt or kill game at pleasure in the fields and enclosures occupied by a tenant. Doubtless, a landlord had full right to make his own terms in parting with his land, provided he can get people to agree to them; but to let land first to grow crops, and then, it may be, to let the right of consuming these crops, or to retain it for himself, is, to say the least of it, unwise on the part of the agricultural tenant, and not very creditable on the part of the proprietor. In Scotland, tenants are invariably assured that the game will be kept down, so as to prevent injury to the crops, and this promise is generally kept by the great majority of landowners. Still there are numerous instances of great losses to tenants, particularly where hares and rabbits are preserved. It is true many tenants bind themselves to refrain from seeking all redress from losses of game, however much their crops may be destroyed. It is exceedingly foolish, but it is more so in appearance than in reality, as game damages are found to cost more in recovery, even when successful, than the amount claimed, that is to say if the landlord litigates the case, as he has it in his power to do, and generally does. If the suit is commenced before the Sheriff, it can be taken to all the higher Courts successively; but even if begun before the Lord Ordinary in Scotland, it can be carried to the Outer House, and then the Inner, and finally to the House of Lords. The decision there is final on the merits, but the amount of the claim falls to be settled by a jury trial, which may result in a new or second trial on the ground of the damages being excessive. The expense and anxiety of this course of action makes it wisdom on the part of the tenant to submit to the first loss, and endeavour as speedily as possible to get quit of the farm. Were actions for game damages to be final before the sheriff or paid magistrate, justice would be more easily attainable, and landlords would then become more chary of increasing game to an unreasonable amount. But, besides the actual damage done by game, it is the cause of more jealousy and quarrels betwixt landlord and tenant than all other causes put together. I was lately shown a letter written by a proprietor to one of his tenants, dated only last month, and of which I took a copy as a curious specimen of the light in which some proprietors view their tenants, and the insolent conduct they sometimes, unconsciously, use towards them. In this letter the landlord complains that the son of the tenant "had been shooting rabbits, and without the slightest excuse in the way of their damaging your crops. Sometime previously my keeper and gardener saw your son and another person, near —, having a greyhound with a loose rope round his neck. Of course it

is not difficult to conjecture what was intended. You are yourself, I believe, aware of an incident where your son, and I believe two other persons, were distinctly seen to course several hares. Whether this was on my ground or that adjoining I am uncertain. However, I fancy it is very doubtful whether the proprietor's permission was given to such a proceeding." Finally, he "hopes he may have been misinformed;" but does not think having him for a tenant a subject for congratulation. Now there is not one word about game in this tenant's lease. Rabbits are by law game and not game; but they are not game to the tenant in this case, and he could shoot or trap them as he chose. The landlord, in fact, admits this, though he seems to think the rabbits should have first damaged the tenant's crops. I would ask what did they live and multiply on but the crops? they could not be there at all without damaging them. Then the boy seen with the greyhound, and the rope round his neck (a boy under nine years of age!) on the public road—why, he was simply taking home the animal that had strayed from a neighbouring farm, the same where the coursing took place. This story of the coursing is a beautiful illustration of the sort of tales carried by gamekeepers to their masters, and of the credulity of the latter. The keeper had seen "distinctly" this tenant's son and two other persons course several hares, but were unable to say whether it was on this farm or that, though it was on an estate where the tenant had leave to course, and where the boy went by invitation. Mark also the view the landlord takes of what he styles "such a proceeding" (the coursing of hares by a tenant). "I fancy it is very doubtful whether the proprietor's permission was given." The arrogance of this letter will be more apparent when I tell you that this tenant has spent several thousand pounds (not a penny of it made by farming) in bringing into cultivation some 200 acres, by trenching, liming, draining, and fencing with stone walls what was previously a barren heath. He was under no obligation to do so, and it is doubtful whether he will recover the whole of his capital. But one thing is certain: he will at the close of his lease return the farm to the landlord worth a great increase of rent, the effect of these permanent improvements effected by him with his own capital. Few tenants care about shooting or hunting. I believe not one in ten would use the privilege if they had it, and I have come to this conclusion from my knowledge of those who have or have had the sporting on their farms. But there is one thing they do dislike, and that is being watched and challenged for herd-boys firing guns and sheep-dogs frightening hares. I will say further, tenants are glad to see the landlords sporting on their farms, provided the game is only sufficient for fair sport, and that it is not preserved for a single day's murderous slaughter, as is now the fashion, and the produce sent to the poulterer, to the diminution of that produce which should have been sent to the butcher. Partridges, even when numerous, do comparatively little harm to crops. Pheasants are very destructive, but they are confined to particular localities, where they are reared under hen-coops, and fed by the hand when young. They are excellent birds on the table, but I cannot see the sport of shooting such large half-tame animals. Cultivated land in the neighbourhood of preserves should be in the owners' hands; but if farmers do hire land in such situations they know what they may expect. Sometimes preserves adjoin the farms of other proprietors; and I have known some hard cases where the tenants' crops were greatly injured year after year by game reared on adjoining properties, and the tenants refused all redress. But hares and rabbits are the great causes of complaint, and they increase rapidly if only let alone. On many farms Swedish turnips cannot be left on the ground during the winter without great loss, as the hares break the skin of root after root, which renders them liable to be easily destroyed by frost. It is often impossible to lift them in the autumn without poaching the land in wet weather, and even if they could be removed, they are worth much more to consume by sheep in spring on the land where they grow. A perusal of the evidence given before Mr. Bright's Committee on the Game Laws cannot fail to prove the difficulties farmers have frequently to contend with in regard to game, and the damage done to their crops by hares in particular. The evidence of the late Mr. Pusey, Sir Harry Verney, and Lord Hatherton is most conclusive on these points. I will only quote a few words from Lord Hatherton's evidence: "I soon found, as a farmer desirous of introducing among my tenantry and into the neighbourhood a better system of cultivation, that it was utterly hopeless to

do so unless I completely destroyed the hares; for the attempt merely to reduce them was useless, for a good season repaired their numbers to such an extent that I found there was no effectual cure but destruction." And again: "Hares will travel miles to the nearest field of Swede turnips," a statement which I can personally corroborate. I have even counted one hundred hares on a young grass field on a spring morning, not half-a-dozen of which remained on the farm during the day, but retreated to their cover fully two miles off. No one who farms land extensively, or who takes a practical interest in agriculture, will continue long to consider hares game, or anything else but a nuisance. The Marquis of Tweeddale is well known throughout the kingdom as a most enlightened practical agriculturalist. I do not know a single person who makes his bread by farming whose reputation for skill in agriculture stands so high as his lordship's does in East Lothian, or who has done so much in introducing and promoting a profitable system of farming. Now, his lordship preserves partridges and pheasants for sport to his friends; but hares are not permitted to consume either his own crops or those of his tenants. Lord Tweeddale also sets a noble example to other landed proprietors by his systematic destruction of wood-pigeons, which are a pest that cause more loss and expense to farmers, as a body, than even game; but they have increased to their present enormous numbers simply from extensive woods and plantations being devoted to the rearing of game, and by gamekeepers destroying all birds of prey. But to return to hares, I think it must be evident that their preservation in a cultivated country is quite irreconcilable with the interest of the general population. Whatever I have said as to hares applies with double force in regard to rabbits. Let both, then, on all cultivated land, be considered by the law as vermin, and after that landlords may make what stipulations in their leases they choose regarding them. There is one thing I decidedly protest against; and that is a licence, for even the smallest amount, being necessary for their destruction any more than for the killing of rats and mice. If a farm were let on condition that rats were to be preserved for sport to the landlord, and should a farm-labourer accidentally or even systematically destroy them, I do not think any penalties could be inflicted on such a person or even on the tenant of the farm. But if the licences are retained (unless the sanction of the proprietor is granted for destroying them), nothing will be gained by any change that can be proposed. I know it is said, Why do not farmers make such stipulations in their agreements with their landlords as to ensure their freedom from game ravages? Doubtless it is in the power of a tenant to refuse to occupy land unless the game is let along with the right of cropping, but this is not and has never been the custom. The game has ever been universally reserved by the proprietor; it is impossible to obtain land on any other condition, and those who insist on having the game may make up their minds to retire from the profession of a tenant-farmer. It is the law, and the law only, that enables the proprietor to carry out his terms in regard to game. The tenant is the weaker party, and surely it is not asking too much to have so far abolished this law which enables the stronger party to carry out measures so detrimental to the rural population. But there are ways in which some farmers protect themselves from hares, and one is by having an active man on the farm who knows how to set a wire. This is much more common than is generally supposed, but it frequently leads to great evils. I have known some old men who have snared hares from their youth, and who never went further; but as a rule it is merely a training for those who make midnight incursions into pheasant preserves. By a single night's work in these preserves as much money is realised as by a month of honest labour. Riotous dissipation and idleness are sure to follow. Necessity soon compels them to try it again and again. If caught at last, "To jail with them!" is the order. The chaplain there finds it impossible to effect the slightest reformation in them, as they indignantly deny they are thieves. They confess to having broken a law, but then it is a law of man's making, not of God's creating—for no one can say that these laws carry on their front the broad impress of truth and justice, which all laws ought to have. One great improvement in the administration of these laws would be to have the trial of offences under them conducted before the paid magistrates in England and the sheriffs of counties in Scotland, in place of the justices of the peace as at present. In the Night Poaching Act the sheriffs are mentioned, and have jurisdiction; and all trans-

portable offences must be tried by the Court of Justiciary. Now, justices of peace are almost the only individuals interested in this matter; while their powers of punishment are great and arbitrary, and their judgments on the merits are final and conclusive. In both common and statute law judges are debarred from sitting in judgment where they or their friends have the remotest interest; but these game-laws have been enacted and are maintained for the sole benefit and pleasure of the very men selected to try offenders against them. One of the worst features of the game-laws is the cumulative penalties that may be heaped on an offender. A person trespasses in pursuit of game. He is taken in the act; and a justice of the peace fines him for such trespass. But he has killed a hare or pheasant; a second fine is inflicted for being in unlawful possession of game, not being a duly qualified person. If he pays these two fines, he is next brought up for want of a certificate; and instances are by no means rare of persons being thus punished three times for the one offence. To show that these punishments are not light, I will try and state shortly what the game-laws really are in Scotland. To kill game legally, it is first necessary to be in possession of a ploughgate of land—an undefined quantity, generally estimated at 60 or 70 acres. A person not so qualified having in his possession any game without leave from a qualified person forfeits for the first offence 20s. and for all others £2; and in case of non-payment within ten days, suffers imprisonment for six weeks in lieu of the former penalty, and three months in lieu of the latter. If charged with being also in pursuit of game without the qualification, the penalty in addition to the above is also £3 6s. 8d. A licence or game certificate is also necessary. A person acting without one is liable for a penalty of £20 with costs, and also in the amount of duty, and failing payment, imprisonment for six months. Prosecutions may be tried summarily, though the parties be absent, before two justices of the peace, or one justice, provided he is also a commissioner of supply—that is, the owner of land worth generally £100 a-year. Sheriff Borelay, in his singularly instructive pamphlet entitled "Curiosities of the Game-Laws," remarks on this—"It is declared that the conviction must be by two justices. But mark the strange addition: if a justice be also a commissioner of supply this is held to be equivalent to two justices rolled into one. Because he can add to his signature the cabalistic letters J. P. and C. S. he is held to be a judicial engine of two justice-power, capable of exercising the dynamics of two minds, or, in fact, 'a man beside himself.' We venture to say, ransack the legislation of all ages and all lands and such a monstrous anomaly will not be found as this, which blots our statute-book, and is in daily exercise in these highly-favoured lands." A distinction is drawn in these laws between day and night poaching, the day time being the first hour before sunrise until an hour after sunset, the remaining time of the twenty-four hours being held to be night. A trespasser during the day forfeits a sum not exceeding £2, with costs. Where an individual is disguised, or five persons trespass, each person forfeits a sum not exceeding £5, with costs. If a trespasser refuses to leave the ground, and to give his name and address, he may be seized and conveyed to a justice of peace, and summarily fined £5 and the costs, or, as we say in Scotland, the expenses of process. In default of payment, the justices may imprison for two months, with or without hard labour. Under the Night Trespass Act any person entering upon land, open or enclosed, with instrument for destroying game, is liable to be imprisoned for a period not exceeding three months, with hard labour, and at the expiry to find caution, himself in £10, and security for the same amount for avoiding such offence for a year. Under this statute, the Sheriff of Haddington not very long ago sentenced an individual to one week's imprisonment with hard labour; but, failing to find security, he underwent six months' imprisonment in addition, with hard labour. So, for an offence which the sheriff considered a week's imprisonment the proper penalty, the poor man, for being unable to find security, had to endure six months in jail, with hard labour. For the second offence, the primary imprisonment is extended to any period not exceeding six months, and the security then required amounts to £30 altogether; also, the term of bail to two years, and the imprisonment is extended to twelve months—making in all eighteen months' imprisonment, with hard labour. The third offence may be punished with transportation for seven years, or imprisonment, with hard labour, for a period not exceeding two years. Persons to the number of three entering on land for the purpose of killing game with fire-arms, bludgeons, or other

offensive weapons, are liable to be transported beyond seas for not less than seven or more than fourteen years, or to imprisonment with hard labour for a term not exceeding three years. Transportation beyond seas having now been changed to penal servitude for the like period, there arises an obvious conflict between the two modes of punishment. By an Act of 1844, the Night Trespass Act was extended to the taking of game or rabbits on any public road, in the like manner as upon land. Only the actual taking of game is necessary for conviction under this statute. It will be observed there is a very great distinction between the penalty or punishment for a game-law offence, depending on whether it has been committed during the day or night. For a day offence, the penalty is a pecuniary one, subject to modification, while for a night one it is imprisonment with hard labour, which cannot be modified. The offences are distinct and separate, and it must be stated under which Act the prosecution is conducted, as a minute of time or less would have the effect of placing the offence under either the one or other of the statutes. It is often difficult to determine whether offences committed in the morning or evening belong to the day or night, and the proof is frequently very unsatisfactory as to the exact hour the offence was committed, or the time the sun rose or set at the place. It would surely be better to return to the hours fixed for summer and winter by the old Act—repealed, I think, in 1831—than having the time fluctuating, as it is now, both morning and evening. Any person killing, selling, or buying, or having game in his possession in forbidden time, forfeits £5 for each bird; and in case of failure to pay within ten days, is liable to two months' imprisonment for each £5. These penalties admit of no modification. In one case the combined penalties against one individual amounted to £220, and the consequent imprisonment to seven years and five months; but the private prosecutor restricted his complaint to four birds, or £20 of fine. But surely this is a power too enormous for any private prosecutor to possess in the punishment of individuals. Public carriers, too, are liable to it, though they may even be in ignorance that they have in their possession such precious carcasses as moorfowl or other game. That this law must be systematically broken is evidenced by the fact that the greater part of the licensed game dealers in London and elsewhere present for sale any quantity of the different varieties of game on the morning of the day on which their being killed is lawful. At the close of the Parliament of 1862, an additional game-law was placed on the statute-book. It applies to the whole kingdom, and its chief provision was to enable the police to act as gamekeepers. It empowers them in any highway or public place to search any person they suspect to be a poacher, and also to stop and search any cart or other conveyance in or upon which they suspect game to be carried. But this search can only take place on a highway or public place, so that the poachers have only to leap a hedge and set their pursuers at defiance. In some counties in Scotland gamekeepers have been sworn in as constables to meet this difficulty. Gamekeepers thus become the servants of the Queen though remaining the paid retainers of private individuals. This Act was vigorously but unsuccessfully opposed. It contains several anomalies which renders it still doubtful how far it is workable in Scotland and Ireland. It places rabbits again in the list of game animals, and even increases the penalties for game offences; for simple trespass, for instance, from £2 to £5; and as the previous Act is not repealed, it is probable an offender may be mulcted in the penalties under both statutes. The resolutions adopted by the Scottish Chamber of Agriculture were:—

"1st, That hares and rabbits be dropped from the game list.

"2nd, That all prosecutions for offences against the game-laws be transferred from the justices to the sheriffs of the respective counties.

"3rd, That cumulative penalties for the same offence be abolished.

"4th, That damages be made eligible by statute in all cases of injury caused by increase of game during the currency of the lease—the amount to be determined under the authority of the sheriff."

If effect were given to these resolutions by legislative enactment, it would satisfy by far the greater proportion of agricultural tenants, would tend much to make a better feeling in society, and, if the complexities of these laws were simplified, and their cumulative severity diminished, so that even the object at which they aim would be better attained.

they would more generally enlist in their favour the feelings of the community.

Mr. ROBERTSON, of Dundonnachie, Dunkeld, said he had listened with great pleasure to the able paper which had just been read by Mr. Hope; but there was one very important subject that had been entirely omitted by that gentleman. That subject was one which was now engaging a good deal of attention in connection with the game-laws, not only in Scotland but also in London, from the controversy which was now going on between Professor Leoni Levi and the Duke of Argyll. It related to the great extent of deer-forests which were preserved in different parts of Scotland; and he believed it was fraught with so much importance that it would in a short time come to engage the attention of the legislature itself. Large tracts of land which had hitherto been used for the rearing of sheep, and from which a large amount of food for the supply of the people had been obtained, were now absorbed for the purpose of deer shooting. Only within the last month a very extensive grazing farm, which had afforded pasture ground for not less than 8,000 sheep, had been diverted for this purpose, and was now almost totally lost, so far as its capability of producing food was concerned. He had lately read a paper on this subject—written by a gentleman very well known in Scotland, Mr. Horatio Ross—in which he endeavoured to show that deer bring as much food into the market as sheep do. From his (Mr. Robertson's) experience, and from his knowledge of deer forests, which was pretty extensive, he could say that deer forests were totally unproductive for the interests of the community. The whole of the Grampian range indeed—a large amount of territory which includes many thousand square miles—was now being laid entirely desolate, in order to find room for the deer. The preservation of these animals were highly injurious to the morals of the community, because a large amount of poaching was encouraged, and a great many evil habits were engendered by engaging in that unlawful pursuit (Hear, hear). The late Duke of Athole, he might mention, was so convinced of the evils attending the preservation of deer, that he contemplated breaking up the great forest of Glen Tilt, and turning it again into a sheep walk; but he was sorry to say that these excellent intentions were frustrated by the death of that lamented nobleman. Mr. Robertson then quoted from Vattel, to show the bad effect on the community of the preservation of game; and he also read a few lines from Burns' poems, showing that the pursuit of game was apt to engender feelings of cruelty and lawlessness in those members of the community who engaged in it. He hoped the subject, which was one of great importance, would receive attention from the Social Science Association and from the country. He knew of no subject—and he supposed he was well acquainted with the state of Scotland generally as any Scotchman of the present day—in which the agriculturists of Scotland were more deeply interested.

The CHAIRMAN (Mr. Holland, M.P.) thought that in connection with this subject the association ought to be very much obliged to Mr. Hope for favouring them with his very interesting paper, and he congratulated Mr. Hope on the fact that the subject of the game-laws was the first that was brought under the consideration of the members of that Chamber of Agriculture which he himself had been the chief means of founding in Edinburgh. The establishment of the Chamber was indeed a great rise to agriculture. It threw her more into the social scale than she had ever been placed before, and the result would be that not only would they, in course of time, do away with the game-laws, but with many feudal matters which now interfered with the due cultivation of the land. The question of the game-laws had now been before the public for a long period. Ever since Mr. Bright's committee made their report it had been brought forward from time to time, and that report had been quoted, quotations from it had been read with avidity by those who were most interested in the management of game and in the prevention of its being a check upon the occupiers of the soil. With regard to the division which took place in Parliament some years ago—in 1862—he might say that this was considered an extraordinary division on the part of those who were in the minority. It was a larger and a stronger minority than had been anticipated. He had the pleasure of voting in that minority, and those who voted with him felt convinced that the game-laws would be a question which would not very long be prevented from coming again before the public, and that at length—before many

years were over—the feeling of the public and of the landed proprietors would induce them to make such a change in the law as would benefit the occupiers, and at the same time would produce on the part of the labourers a great inducement to avoid those immoral habits which had arisen under the system of game preservation, and which had caused so very much crime in the course of those years during which the game-laws had been in existence. That crime had been increasing a amount year after year, and was telling sadly against the morality and good behaviour of the lower orders of the population. He trusted that through the exertions of Mr. Hope and others, not only in Scotland but in England, they would soon find that the existence of the game-laws was limited.

Mr. HENRY WILSON, Mansfield, Nottingham, said that until the matter was thoroughly ventilated, and until the public mind was brought to bear on the subject, they could scarcely expect to get any alteration in the game-laws. He was surprised to hear some of Mr. Hope's statements, as, for example, that there had been 10,000 convictions for offences against these laws; and he thought if these facts were placed prominently before the public they would see that this was a matter which affected not the owners or occupiers of land only, but the whole community. One very important consideration was the position which the landlords themselves occupied through the operation of these laws. Only yesterday he was told by a respectable farmer that he had got notice to quit his farm. On asking the reason, the farmer informed him that he had been fool enough to talk too much about the game-laws. He had been complaining of the damage done by the game to his crops, and his landlord, not liking to hear so much about the matter, gave him notice to leave. That was the way in which free speech on this subject was sought to be put down.

Mr. GEORGE HURST, Bedford, said that a great deal of the poaching which was so much complained of arose, not from the fact of the preservation of game, but from the very unfortunate circumstances in which the agricultural labourer was too often placed. During the winter-months and a great part of the summer months, a great proportion of the agricultural labourers in the country were unemployed; and as their remuneration when they were working was small, they were glad to take advantage of any opportunity of adding to their own and their families' subsistence. He thought the game-laws might be greatly improved, especially in the way of simplification; but he did not see how they could do away with them altogether. The game must belong either to the owners or to the occupiers of the land; and, as between the one and the other, an agreement must determine who had the right to kill game. He did not see that the tenant had anything to complain of, if he took his farm knowing that the landlord reserved to himself the entire right of shooting over it. If damage were done to the crops from game, it was one of the consequences of the agreement the farmer had entered into.

Mr. T. WYCLIFFE WILSON, Sheffield, thought that the last speaker had entirely misapprehended some of Mr. Hope's remarks. That gentleman did not mean that there should be a right given to every one to trespass over unenclosed lands. Indeed, in the event of the game-laws being altered or abolished, it would only be right that a stringent law of trespass should be passed; and that would have the effect of removing the objection which he had stated.

Mr. EDGAR (Secretary of Department) remarked that Mr. Hope had scarcely dealt with the law of the subject as it affected England, and as laid down in an elaborate judgment of Lord Westbury in a recent case. He would like to ask Mr. Hope whether it was the case, as stated by one of the speakers, that many agricultural labourers were idle several months in the year?

Mr. HOPE said that in Scotland there was no such thing as a labourer being unemployed for part of the year. The agricultural labourers there were equally well employed throughout the whole season. With regard to the legislation necessary if the game-laws were abolished, he had distinctly stated in his paper that, if the game-laws were abolished altogether, they must have a trespass-law, and that that law should be made to apply even where no damage had been done. He would, however, have the penalty of moderate amount—say about forty shillings, which would probably prevent some of those murderous conflicts which took place between the gamekeepers and the poachers, the latter being tempted to resist to the utmost, owing to the severity of the

penalty. He believed that, even if the game-laws were greatly modified, the game would still be sufficiently plentiful, although it would not be so large as to be destructive to a farmer's crop. Things were so bad at present, that in some cases they employed men to snare the hares. This was a very bad state of things for farmers to be exposed to; and he hoped they would soon see an amendment of the law in regard to this matter.

This closed the discussion, and the section adjourned.

The following paper was also read :

### THE GAME-LAWS:

#### THEIR EFFECT ON THE AGRICULTURE OF GREAT BRITAIN, AND ITS SOCIAL SYSTEM GENERALLY.

BY THOMAS M'COMBIE.

There are two distinct heads under which the following remarks are classed: 1. The effect of the present game-laws upon the agriculture of this country. 2. Their influence upon society, especially the poorer classes. The warm interest which has been exhibited recently in the game-laws and game-preserving induces me to propose, at the "Committee of the Fourth Section of Trade and Economy," that the whole subject should be taken into consideration at the present meeting of the Social Science Association, at a special subsection on agriculture. I do not think that too much attention can be bestowed upon this important question; and I regret that I do not feel myself competent to do it full justice. I only desire, however, to introduce it, in order that able men may express their opinion upon what must be regarded as an anomaly in legislation, and a social grievance of some magnitude. The few remarks I shall offer will be rather of a practical than theoretical kind, and I hope it will be considered in a liberal and comprehensive spirit. I should hardly, however, have thought myself justified in wasting the time of this section by entering into any dissertation upon the historical phases of the question. Simply taking the game-laws as we find them now in existence, let me consider, firstly, their effect upon the agriculture of Great Britain. The tenant farmers are in a very different position now from that in which they were placed in the feudal times, some centuries back. In not a few districts, they are almost universally well-educated and independent-minded men, who pay a high rent for the land they farm, and, in reality, owe little favour to the owners. The market for land is similar to other markets—the owner is generally compelled to let, and the occupier to lease land. This differs little from purely commercial transactions; and the sooner it comes to be recognised as such the better for all the parties interested. The farmers are the great producing class, on which the other classes, to some extent, depend for food. The greater the quantity of animal and vegetable food which they can produce, and the cheaper the necessities of life, the better for all the consumers in the country. I think one of the most objectionable features of the game-laws is this—that they have a sure tendency to decrease the amount of food actually produced in the country. In those parts where hares and rabbits are abundant, this is more especially the case, as the grain and other crops are often destroyed. Did the landlords merely preserve the game for their amusement in fair sport, there would not be so much to complain of; but, in numerous instances, they turn the matter into one of commercial profit. On many properties, waggon-loads of game are taken to the markets and turned into money. This is certainly an abuse of sport; and it is not much to be wondered at that a good deal of ill-feeling has been engendered between the landlords and their tenants. The latter give the highest rent for the land that in most cases can possibly be squeezed out of them, and it is very hard upon them to have to keep up the wild animals so that a second rent may be obtained. They know and feel it is a gross imposition upon them, which they are, in the majority of cases, unable to resist; indeed, in many districts, so great is the competition for land that they are frequently compelled to take it on the owner's terms. Game preserving is thus no longer merely for sport such as amused the olden class of gentry; it is a system of wholesale breeding and slaughtering to supply the London poulterers; and this is all done, not at the cost of the landlord, but of his tenants. This new system has been gradually introduced, and the raw

and new farmer, in competing against those of experience, knows little of what he has to endure from the landlord's game, and he only makes the discovery when too late, and has to endure a gradual decay of means from the depredations of wild animals. The landlords have the tenants bound down by leases which compel them not merely to protect the game, wild fowl, fish, &c., upon their farms, which are all reserved for the landlords, but also to renounce any claim for damages they might have, whatever the amount of loss; and in particular cases, which are well authenticated, the holders of farms have had half their crops eaten up. But the worst feature in these leases has not even yet been stated. The tenants are bound to leave at the first term after found killing, or countenancing any one who is suspected of killing game, and throwing up all benefit from improvements or otherwise under the leases. I know that this fact will scarcely be believed, yet it is quite true; and to prove that it is so, I shall here quote portions of leases which are strictly enforced on four of the largest properties in the North. I may state that these were quoted by my brother—William M'Combie, of Tillyfour, the well-known stock breeder—in speaking on this question at the public meeting in Edinburgh, which was held to consider the game laws. [Mr. M'Combie here quotes from his brother's address, at Edinburgh, the various clauses from leases which have already been published and are well known.] To show that the injury sustained by game on many farms is considerable in amount, I may mention that a case was quite recently brought before the public of a farmer's losses, and the fact remains uncontradicted. A particular farm had suffered from the depredations of game, and no restrictions being in the lease, the occupier received a very large sum as compensation for losses, I believe as much as some hundreds of pounds a year. The new tenant signed a lease which deprived him of this right, and the consequence was that he found himself very speedily a ruined man, and the landlord would do nothing to assist him or pay him one farthing for his losses. Now, the right of the landowners to the exclusive right of the game is even at this time very doubtful. They cannot kill a head of any kind of game without a licence from the Government to do so, thus showing that the wild animals are even yet common right and not merely vested property. The right to kill game until very recently, say 250 years back, was in most parts of these kingdoms enjoyed by the whole of the people. The wild animals that roam the country free and unconfined never can, in any reasonable sense, be private property; and it is only by laws of a most stringent and obnoxious character that landlords have been able during recent times to enforce their unconstitutional claims. These preserving efforts culminated in Sir Baldwin Leighton's Act of 1862, which makes all the police of the country spies and game preservers for the landlords, and authorises them to search any person on the Queen's highway whom they suspect to be illegally in possession of game. The means by which the landlords have effected their great object and by indirect legislative enactments had game declared to be property, has been combination. From their influence in Parliament, which has for many years preponderated, and from having no tenant antagonism to contend with in that great political arena, every measure calculated to repress the right of the people to the game has been carried, and an injustice to the people, and a heavy loss to agriculture, has been perpetrated. The most effectual method of coping with the combined influence of the landowners in this country would be a Tenant Defence League, through which the whole tenant farmers of the United Kingdom should unite themselves together and bind themselves not to rent land on any consideration whatever, unless the power to kill destructive game were conceded. In this way they might protect themselves from that constant and steady infringement on their fair rights which has been going on for a long time. The great obstacle towards obtaining a proper reform of the Game-law grievance hitherto, has been the backwardness of the tenant farmers, who have been so abjectly afraid of offending the landlords that they could hardly even be prevailed on to come forward prominently in any agitation for their improvement to even speak the truth. This want of independence will, I hope, from the increasing effect of superior education amongst the more extensive cultivators of the soil, speedily disappear. Their own interests, as well as those of the country at large, are at stake, and public duty calls upon them to act boldly. There have been four Parliamentary

Committees on this subject during the last forty years, which have been all wrung most reluctantly from the different Governments; the evidence taken in all the four was condemnatory of the game laws, but no relaxation of them has ever been obtained. Rendered bold by the impunity into which the pressure against them had been resisted, the landlord influence forced the Bill of Sir Baldwin Leighton upon the country. The same party, in the subsequent session, defeated the motion of Mr. Forster, the member for Bradford, for a Committee to inquire into the operation of that measure, thus showing their determination to stifle free inquiry into the subject. This was the more extraordinary, inasmuch as the working of the Act had clearly demonstrated that inquiry was absolutely necessary. There had been conflicting decisions of different county benches upon the subject as to whether the *onus probandi* lay on the complainant or the defendant. Not a few of the magistrates decided that, on a charge being exhibited against a man, he was bound to prove his innocence—a most tyrannical decision, contrary to the spirit of English law, which holds every one innocent until proved guilty; and almost unworthy of the dark ages, when the liberty and life of the subject were held in small estimation by the magistrates of the land. The country gentlemen flatter themselves that they will permanently secure the right of property in game without paying rates and taxes on it, and have the police turned into amateur keepers to protect it for them; but, on the other hand, intelligent men think they have already gone too far, and that, in the strong reaction which must ensue, the severity of the existing law will be relaxed. The Government of Lord Palmerston is free from blame in this last instance; indeed, Sir George Grey warmly supported Mr. Forster's motion, and was scarcely able to get a hearing from the House of Commons when enunciating the views of the Government on the subject. The Home Secretary declared upon this occasion that nothing could be more anomalous than the present state of the law on the game question, and we have therefore cause for hoping that a material alteration will be made at no distant day. The friends of liberty and social progress have no cause to regret that Sir Baldwin Leighton has not been re-elected to the present Parliament; the influence of the tenant-farmers having been sufficient to keep him out. The necessity for a sifting investigation into the subject is, perhaps, rendered more apparent by the difference of opinion existing amongst the highest legal functionaries of the country on many points which have recently been brought prominently before the public by the case of *Blades v. Higgs*, and others, and in which the decision of Mr. Justice Willes, who held that a man's property in land did not give him any right to property in animals of a wild nature after they became old enough to escape from the land, was upset upon appeal, and the contrary doctrine affirmed. This would show that the law recognized in most civilized countries, which was apparently the law of this, is no longer so. The game is now held to be the property of the owner when killed and taken, and if so obtained by a trespasser he is held to be in illegal possession of it, and the game legally to revert to the owner of the soil. The Lord Chancellor, however, gave the decision partly on technical grounds. He said, "This conclusion would not be affected, even though it be true that an indictment at common law will not lie against the trespasser for killing and carrying away of game, if it be one continuous act, inasmuch as the ownership of the game is considered as incident to the property in the land; but this consequence is the result of a peculiarity in the law of larceny, which holds that the act of severing and taking away things attached to the freehold is not a felonious taking, a result which does not affect the existence of the right of property." I now come to the social effect of the game laws, and their influence upon the morals of the people. That game preserving and its never-failing attendant, poaching, has demoralised the working population of this country, must be admitted. The law of England would now appear to give the landowner the same right in game on his land as in cattle or sheep, or tame stock; but the people do not recognise this as just. Poaching is, therefore, resorted to by very many who would not steal, or injure property generally; but it has such degrading associations that the moral sentiments are weakened in its pursuit, and its votaries very often end in becoming thieves, drunkards, and even, sometimes, murderers. Were there no preserves, there would not be half so much poaching; and it is the temptation thrown in

the way of the working-classes which leads to crime. Landlords contend that they have a perfect right to preserve game, or, in fact, do anything they think fit with their own property. But this is by no means so clear, in cases where a certain injury is inflicted upon society. It appears extremely selfish for any gentleman, merely to gratify his taste for sport, to inflict a nuisance upon the country, tempting large numbers from the paths of virtue into vicious habits and reckless dissipation, and crowding the prisons and penitentiaries with criminals young and robust, and able to work. The law may recognise game as private property, but the nearly unanimous voice of the public rebels against the idea, and poaching has never been held to be so heinous as any other offence against property. The man who steals a horse or sheep is so far degraded in the eye of society as to have no sympathy; but the crime of the poacher is not stigmatised, and has popular feeling in its favour. Nothing can be more injurious to the society of a country than laws which conflict with the moral convictions of the great majority. The poorest admit the justice of the laws which protect life and property, and all agree, when offences against either are committed, that the offender should be punished. Not so, however, in infractions of the game law. Those who are punished on that score regard themselves as martyrs to class legislation—as men punished by the tyranny of those above them for no real crime, and they command the hearty sympathy of the whole working people, which is clearly on their side. But the poacher seldom stops at killing game; he becomes unable, or unwilling, to work steadily in the ordinary hours of labour, and takes to more dishonest courses: he comes in contact with gamekeepers and police, and in time regards bloodshed without horror; he is led into bad and dissipated habits; and thousands, who but for the first temptation through game preserving would have been honest members of society, end their days in penal settlement or the gallows. The correctness of these opinions may be proved by a parliamentary paper, of date 19th of July, which shows that, during the last year, there were 10,117 offences against the game laws, and of these 8,527 were for trespassing during the day in quest of game. It is not disputed that a large amount of the crime of the country is connected, either directly or indirectly, in country districts, with the infringement of the game laws, and that such offences are largely on the increase. The country proprietors having carried all their points, so as to have the police charged with preserving the game and having it declared private property, and every other concession asked for from Parliament and the courts of law, are now busily engaged in numerous instances in extending their preserves, and thus increasing the temptation to the poor to take to poaching. The fact that the system is tending towards the demoralisation of the people makes it a great national question, and justifies us in calling loudly for legislative interference, in order that game-preserving may be, if not abolished, at any rate maintained within more reasonable proportions. It is a remarkable fact that, while the punishment has been increased, the result, so far from deterring, has had the contrary effect. Prior to 1862, the penalty for the first offence was £2; after that it was by Sir Baldwin Leighton's Bill increased to £5; the consequence being, that the number of offences since are double what they were before the increase. The greatest part of those convicted were so convicted for trespassing in the day time after game, which is not deemed so disreputable and hardened a kind of poaching as night work, the punishment of which is much less severe; the one being by fine only, the other by three months' imprisonment for the first offence, but at the end of that period, unless the offender can find security that he will not trespass in a similar manner, he is liable to be continued in prison for other six months. The extra severity of the laws seems to make our countrymen more reckless in disregarding them. Englishmen in humble life seem to think the game is the property of no particular person, and the more the proprietors determine to punish for killing it, the less they think the offence deserving of reprobation. The offence of killing wild animals is by no means one of a heinous kind in the eye of society generally, and the ease with which landlords have been able to increase the penalties for it says little for the character of our legislation. In the records of the various committees on the subject were the fullest and most conclusive evidence against the Bill of 1852. Yet despite this and the efforts of a few independent men, the obnoxious measure passed into law. Now, it says



but little for the civilisation of a country when law and public feeling are in antagonism and run in contrary directions. The fact that the public generally view killing wild animals as no offence against morality is the surest condemnation of the stringent game laws that have been lately passed, and if the vote were taken there would not be five per cent. in favour of the last law passed in 1862. What, then, can we think of a representative assembly which, taking advantage of the accidental position of its members, should pass a measure so selfish and tyrannical as to be execrated by nearly every class in the country? Were the landlords merely desirous of preserving the game for their own use or legitimate sport, the poor might have some sympathy in their views; but when, in numerous cases, they rather let their shootings or sell their game for their own benefit in London, it can scarcely be expected that such a feeling should exist in the breasts of the other classes. There are many landowners who wish to have double rent out of the land, and then either sell the game or let the land to such as do sell it, and the working-classes form their own ideas of the want of high tone in such trans-

actions, and deem it a small crime to shoot hares or rabbits if the chance comes in their way. Such are some of the evils of the laws running contrary to the public opinion of the class called upon to preserve them, that it weakens their respect for the institutions under which they live. It may be argued that all landlords are not alike tyrannical in causing these laws to be administered with the severest rigour; but those who have the good sense to see the impolicy of such severe Acts of Parliament ought to be the first to desire their repeal. The public have no right to be compelled to take as a favour from any one what they are entitled to as a right. And there is ample necessity for the immediate interference of the legislature, and for a combination of that portion of the public more immediately interested. If the greatest good of the greatest number be the aim of all legislation, then these laws should be repealed or ameliorated. Every friend of social progress and the elevation of the working-classes must earnestly hope for an improvement in our mode of legislation in this important question, and for the blotting out of such unconstitutional acts from the Statute Book.

### THE OVER-PRESERVATION OF GAME.

At the Freshwell Labourers' Friend Society, Colonel Brise said: During the last week or so there had been some correspondence and lectures in the different agricultural newspapers on the subject of the preservation of game. He was struck with one of the observations made, and was induced to look into the subject more closely than he otherwise should have done. It was stated that the preservation of game was an injury to the country; that the man who preserved game was an injury to his country, an injury to his neighbourhood, and an injury to himself. Well, he thought that was strong language, and said to himself, "Let us look at the facts of the case, and see if it is so;" and on looking into the matter, and considering it thoroughly, he could agree with this gentleman so far—that an unfair or over-preservation of game was an injury to a man's country, to his neighbourhood, and to himself; but a fair preservation of game he did not think was an injury in any way to either one or the other. A fair preservation of game only tended to promote healthy exercise and social intercourse, and gave an opportunity of meeting one's friends and spending pleasant days together, and so on; and it was also the privilege of the owner of the soil that he had a right to the game on that soil; and indeed, if that were not so, he thought there would be very few men who would care about investing their money in land at 2½ per cent.; for only the other day a friend of his, who had bought an estate not very far off, said to him, "What a fool I must be to go and purchase an estate which will only pay me 2½ per cent., when I might get 10 per cent. for my money in London." If gentlemen were satisfied with a small return for their money, they deserved to have some privilege as well.—[Mr. Keeble: Fox-hunting.]—Well, they would have something about that presently. There could be no doubt that, if it were not for the sporting, gentlemen would much more frequently absent themselves from their estates, and we should have what was the curse of Ireland at the present time—absentee landlords. Over-preservation of game was a different thing; for it had been said that the necessities of life were damaged to a great extent by animals kept for amusement and luxury, and in this way, no doubt, over-preservation was injurious to the country. We had heard a great deal as to how much a rabbit ate, and some people said that two hares and two rabbits would eat as much as a sheep; and if that were so, great injury was done to the country by keeping too many hares and rabbits. But a fair preservation of game depended on what was considered the number of hares, and so on, there ought to be on an estate. Now, he believed it would be generally admitted that partridges did no harm whatever, that rabbits ought to be killed like rats, and that hares should be allowed up to a certain number. A gentleman who gave a lecture on the subject the other day, and who seemed to think he knew all about it, said there ought only to be one single hare to four acres of land.—[Mr. Portway: Too many.]—That was something like 25 hares to a hundred acres, 250 to a thousand acres, and 750 to three thousand acres; and he must say that

though he had preserved game in his time, he had never committed such an excess as that. He doubted whether one hare to every four acres was a fair proportion; he thought it was too much. He thought one hare to ten acres was ample, and even a hundred hares to a thousand acres would be a very large proportion, and if there were less it would be better. But then it was said that the preservation of game was an injury to a neighbourhood. But he thought a fair preservation of game would be no injury; on the contrary, it would be rather a benefit to the adjoining owners of land, for by preserving the game a man helped to stock the country, and to afford healthy exercise and sport to his neighbours and friends, and was also enabled to send presents of game to his friends around him. But when he went beyond that—when he came to over-preservation of game, he thought he was doing an injury to the neighbourhood. No doubt it was an annoying and irritating thing to a tenant to find his turnips, wheat, or barley carried away surreptitiously by four-footed animals like his landlord's game, over which he had no control. It must be a most annoying thing to a farmer who prided himself on his crops to see in the spring-time of the year, when his hopes were high, his growing corn bitten off and nibbled about by animals, toward whom he could not but feel a great antipathy. This would not tend to cement the good feeling between landlord and tenant, because however good a fellow the tenant might be, he must feel much annoyed and aggrieved at the time; and though it was probable—and no doubt in most cases it was so—that after a time the landlord compensated him and they were good friends again, yet a wound had been inflicted at the time, and it would be just as well if it had not been inflicted. But there was said to be another injury to one's neighbours attendant on the preservation of game. He heard something said just now about foxes, and it was a very difficult thing indeed for an owner of land to carry out the preservation of foxes if he preserved the game. It could only be done by stringent measures being used, and the keeper being made thoroughly aware that his situation depends on whether the hounds find a fox in his cover or not. But the keepers, he believed, were often unjustly accused in this matter. We knew there were many hen roosts in the country, and foxes sometimes were very fond of hen roosts; and he had known cases where ignorant men had been employed to prevent foxes robbing hen roosts, and they had been destroyed in that way by men who did not know what they were about in destroying so valuable an animal as the fox. It was not just that the landlords should incur all the odium when the foxes were destroyed, for it was often the necessary consequence of employing dishonest servants, but it was their duty to see their servants were honest so far as lay in their power. He thought they might attribute the paucity of foxes not so much to their being destroyed as driven from their covers. The constant traffic of the keepers in the covers where game was preserved did not tend to keep the foxes



there, and it was a great chance if they found a fox in the same cover, although possibly he might be in the neighbourhood, and not very far off. This was a very important subject to them all, and one well deserving of their consideration; and he did think, as he said before, that a fair preservation of game was an injury neither to their country, to their neighbourhood, nor to themselves, but an over-preservation was. If it were an injury to themselves—if a man, for instance, chose to spend his money in preserving for his own amuse-

ment—that was his own look out. No doubt game preservers were little aware what damage was done to the underwood and timber by the game in their woods. He believed the underwood was materially damaged by game, and that the growth of young oaks was prevented altogether. He would not detain them much longer on that subject. They had something else to do besides hunt and shoot, though hunting and shooting were a pleasant relaxation from their duties.

## THE NEW FARM.

At last the blessed rain! cleansing the foul sewers, giving drink to the grass roots, washing mildew from the swedes, reinspiring the croquet-lawn, bringing home the wells and refilling the old village ladies' tarred-barrel reservoirs, delighting the young mudlarks—to be led off in screaming terror an hour hence by exasperated maternity—but, above all, dispelling the dread malaria of typhus and cholera.

On the still pool of the river-bend, there beyond the willow, how the glad pellets dance, lightening and darkening in alternate sport! It is even as Byron wrote—

“How the lit lake shines, a phosphoric sea,  
And the big rain comes dancing to the earth!”—

He wrote, however, of his loved lake Leman, little dreaming that his lines should ever be borrowed by a farmer to point the expression of a bucolic!

It is but a short three weeks since the above was written and left. Already how the wind howls around quite wintery, and the lovely October tints are being beaten away, and the general prevalence of colds and bronchial affections warns us how little we can trust the climate of perfidious Albion! How lovely was the weather we had previously, in the which your humble servant, being an Epicurean, revelled—a sort of second summer without the damp of the like Canadian season. But the good this broiling autumn did the tillage-farmer, who shall fairly recount?—to those especially who, like my unfortunate self, succeeded to a foul farm. This is a red sandstone formation, and in the sandy loam couch-grass seems to thrive luxuriantly, spreading out most rapidly its bunch of clawlike rootlets, each one in diameter no less than a full-sized pipe of Neapolitan macaroni.

The custom of this country is to scarify the stubbles directly after harvest—an excellent practice no doubt when the scarifier bites, which it will not always do, and when the ground is sufficiently soft for its tines to tear up the couch mass bodily. Still, under the best of circumstances, with this practice many is the rootlet broken off, and left as a cutting, to strike, against the planting of the spring. The plan of *ploughing in* the couch I like still less, as that is nothing less than deliberately setting new beds, and each separate severed stem of this pertinacious grass will grow.

The plan I find answer best, is to take off all but the share of Woofe's paring plough, and then go down into the soil some four to five inches deep. The fresh flakes of the last year's growth are thus thrown, like sods half-shaken of their soil, roots upwards, with scarcely one cut, in the sun, who rapidly does his part in turn. It is surprising how hard a surface this implement will break up. Then come the harrows and the roller—the scarifier afterwards, and then the chain-harrows to roll into cigarette form, for gathering, the withered masses that strew the surface of the fallow.

And then—what then? what is to be done with the

collected heaps? Should we burn? should we cart off and wash as fodder for the horses, as the French and Flemish do? or should we transport them to a heap in the corner of the field, and mix with lime and salt, to make the weed pay penalty as a manure in its turn?

Each plan I think a good one. The burning does, of itself, an infinity of service to the soil. The mineral ashes left are invaluable, but then the vegetable element is lost, having fled in the smoke of the fire.

As fodder, well washed, it is said to be excellent. Is it not what the grass-cutters of India provide for their pig-sticking master's Arab? But the question is whether, having the prejudices of the farm-servant to overcome, it would not be unsafe policy, as of course he would take care that it was no saving, as regards the supply of corn and roots and hay; and besides, he would throw out, as rejected by his team, a quantity to vegetate and hold on its mischievous life on the manure-heap behind the stable, thence to return duly to its former haunt.

Then a good plan is it, again, to pack up tight the mass, with a dressing of lime between each layer, to make it a compost for the meadow, that will bring up the year's white-clover leaflets thickly for the nibbling of the lambs when the ewes' milk shall begin to wane. But of all these plans, “which be the best?” as a rustic hereabouts would inquire.

Alack-a-day! what should one do? To decide—is it not the most disagreeable necessity of every-day life: Oh! that some one would say, Do this, or that; then, having attended to orders, one could comfortably repose, and is not my bailiffs in the right when he says, as he often does, compassionately, “Please, sir, I wouldn't be you for anything. When my work's over my mind is free, and I can go and have a pipe upon the stile; but your work is always going on, and your mind is never free!”

But from another point of view, the exceeding dryness of the past summer has been very trying to the temper of the cattle-breeder. Whether from this cause, as is likely, or not, anyhow the cows don't hold, especially if they be at all obese. They should be cool enough, in all conscience, for they have stood for months, half the day, knee-deep in the waters of a swift and limpid river; but somehow they don't hold. Every three weeks they return most provokingly to bull, and that to different bulls. I see that Mr. Tanner notices the occasional occurrence of this sad fact, and attributes it, in his able essay just published in the *Royal Agricultural Journal*, to the extraordinary heat. Whatever the cause, anyhow it is a great sell, especially to those who own Shorthorns of price. What with the wife grumbling incessantly about the want of cream, and the certain loss of interest on capital invested, arising from this barrenness, it is really no joke. I have at this moment three bulls in my stalls, and about a score of buxom cows upon the pasture, not one of

hi ch do we know certainly to be in-calf.

Writing of cattle brings up a pretty picture of home-

stead enjoyment that I saw, not long since, in my farm-yard. Upon one of the last broiling days, just under the lee of the cider-mill, in a sort of moat, that I keep full in case of fire in the stackyard, there stood, calmly chewing her cud, and just flicking the flies off reflectively from her flank with her tail, an aged white cow, that once, under the training of Culshaw, wrought wonders at the Paris and Salisbury Shows. Swimming around and about her, steering handily on their pivots as a gunboat or the Alabama, were some dear domesticated pet wild ducks, popping up and catching the flies from the cow's white-skin, and almost before they settled there nipping them off, to her evident relief and their own private satisfaction. It was a delightful contrast for the contemplation of the indolent. The placid, white old cow in the red-marl-stained water, with the feathered fleet of quackers cruising happily around, and doing her kind service, while they fed themselves, and helped to diminish the plague that is quite besetting this district at present.

This fly abomination! Can it be that the hatches intended for next year are being already quickened by the unusual heat, just as we read of the young crocodiles bursting through the crust of hardened mud under Mungo Park's bed in the desert, having had their egg-covering prematurely chipped by that worthy's weight or warmth.

How devoutly do I not hope that it is so! Then deliverance for the maulin curtain and the whitened ceiling which are now so cruelly bespattered and destroyed! Then good riddance of the villain swarm that gathers in the beer-tap and does its best to be swallowed in a dozen household shapes!

But to return to ducks and their effect upon the meat question. How thankful am I not that I took such pains early in the spring to see that the greatest possible multitude should be reared from our hens and ducks! Have we not such an array of the last—such an army of the former, that our neighbouring friends, with watering teeth, will wonder how ever we can consume them? and do they not come in convenient now, to ease the butcher's bill? and don't they help to swell the farm profits by being content to fatten on the trough of steamed decaying potatoes, just thickened with a pinch of barley-meal? It is worth while hearing how we saved so many. The plan is at once so simple and effective. It was thus: We let the old ducks make their nests where they would, under the heaps of firewood and hedge-clippings that we had carted and thrown down along the edge of the pool, purposely at once to serve as fodder for the oven and to supply shelter from the fox—both two and four-legged—to the brooding ducks. Of a sudden there were several missing at their morning and their evening feed. Anon, one would appear at odd hours, but with so earnest, bustling a demeanour that one had not the heart to scold them for their want of punctuality. And it paid us for our charitable intention in giving them an extra-ordinary meal, when one morning, passing by the pool, our attention was caught by the plaintive wailing of a duckling, as though in distress. We stop to listen and look: when we notice he has dropped from the bank above, as his brother just drops in our view, and sets up at once an involuntary wailing, as though, human-babe-like, he appreciated not as he should his sudden morning wash. Gradually the lot drop out, and at last the fond parent herself flies down with a splash, having for a while most faithfully devoted herself to the hatching of her due complement of eggs, regardless of her infants' cries below, until at length she makes up her mind to follow, despairing of the vitality of the one surviving egg.

Parenthetically, we would observe that all sorts of fowl

invariably hatch a larger per-centage when they are allowed to make their own nests than when they are *set* by the henwife.

But to return to our duck: just as she proudly sails by through a strait, beside which we are in ambush, with her merry, dark young brood in tow, that are veering around so sharp and jumping at the flies, just then we slip under the landing-net and whip out a pair; then three, and a fourth, and six more, and there is a grand piping in chorus of distressed and affrighted duck juvenility in the covered basket; and then, alas for the feelings of maternity! the whole new brood being walked off briskly to the old henwife's charge, our parent duck but takes a header in the dark flood, and flirts her tail and washes, and feels, no doubt, delightfully her change from incubation to her cool native element, and away she sails down the water-side, so enjoyingly drinking up her beakers, if we may use the expression, until her lord and master observing her, there is a chase and a flight, and they are lost to sight; all ending, however, in her, within a few days, refeathering a nest, and depositing new eggs, and commencing a new term of earnest reproduction. Whereas, meanwhile we, the hard-hearted ones, bear off our wailing freight, finally to turn them out into a wire-fenced, covered court, where there is an old duck hissing at us over her already almost overgrown charge, which, with this new accession, now numbers forty-odd ducklings. All these, however, during the day she proudly and efficiently attends to, instructing them to paddle in the milk-pan that just floats with an inch of water upon a sod of grass, as well as the due use of their chop-sticks in the trough of mashed meal and potato. But at night this will not do: they die then by dozens, if neglected, from want of warmth, the old duck obviously being unable to shelter well above a dozen or so. The duty of the poultry-woman is to catch all the others, and stow them away in the back-kitchen in a hamper or covered basket in some wool, under which is placed a hot bottle. They are thus in the morning bright and fresh, to rejoin their indefatigable mamma. We have lost but few since we adopted this system.

I have just been shown another greatly improved grass mower. Of machinery I am very fond; and once again, as so often before, is suggested to my mind the inquiry, why won't the machine-makers take fair pains, and improve their implements to the utmost *before they bring them out*?

For their own sakes it were advisable. Not only would their sale be vastly increased, but the farmer would have some comfort in buying. I have of late, as many others that I know, become wary of sinking my money in useless or improveable implements. I have had two mowers and two reaping machines on a small holding, and they were all comparative failures. The defects we soon perceived, but could not remedy. Why could not the makers have fairly tested their model, and, on finding that in work the grass clogged in front, have improved the machinery at once? It were undoubtedly their interest to do so. I have mentioned the mower, but my remarks must be understood to apply to all other new implements. Farmers get disgusted, and afraid to purchase. It reminds one of an auctioneer of ponies, the other day. "This is the most perfect cob of the lot"; and when this was sold at a good figure, out came the partner, and from the lips of the oracle, to our astonishment, "Now, here is a better." There were a number of his audience who lost confidence in his statements in a moment. I have spoken more than once to implement-makers and their agents upon the subject; but the only answer one gets is, "If you only knew the expense and trouble we go to in perfecting our machine, you would not wonder or complain." That, excuse me, is nothing to the point. There should be no gross de-

fect left when you offer it for sale. If an implement be fairly tried in the service for which it is intended—grass-cutting, reaping, and so on—defects that will disgust and dishearten the farmer would be at once apparent and remedied; after which the sale at a fair price of a really efficient, simple implement to facilitate labour would surpass calculation. The gross inefficiency of so much machinery when first brought out is the great reason why men decline to invest therein. There is always a very general prejudice against a new implement, and the least defect

consequently gets highly exaggerated. Let the inventor and improver take this to mind: "Don't attempt to introduce until you have perfected and simplified"; and he would be surprised at the difference of the haul that would follow.

But I don't like complaining, and, hush! there's the music of the merry beagles across the water; and as I run to the window, there my friend pops so cleverly over the quickset on his cob! and is waving his cap, that I must be off, to show our bantlings the fun. *VIGIL.*

## THE DUKE OF ARGYLL ON STOCK-BREEDING.

On the 14th of October the Duke of Argyll entertained the landward tenantry on the Inverary estate at the Castle at Inverary. The noble Duke presided on the occasion, the Marquis of Lorn occupying the chair at the lower end of the table.

His Grace proposed the usual loyal and patriotic toasts, after which he proceeded to give "The Tenantry of Scotland." He said: I am glad to congratulate you as representing at least a large class of the farmers of Scotland, namely, the stock farmers—the farmers chiefly interested in the breeding of cattle and sheep. I think I may congratulate you on a period of long-continued and increasing prosperity. So far as my conversation with the tenantry of this country enables me to judge, I must say that they are accepting that prosperity in a very proper spirit—by no means in a spirit of overconfidence, not being inclined to say, as David is reported to have said in circumstances of great prosperity, "In my prosperity I shall never be moved." On the contrary, I have always found the tenantry doubting whether such extraordinary prosperity could possibly last—whether it was to be expected that such unusual prices as we have been realising for our stock in this country could possibly be a permanent state of things, and rather fearing that, prices having become very extravagant, there might suddenly be some revulsion in the markets of the country. That has been a common fear expressed to me; it has been a fear expressed by my rev. friend beside me, Dr. Smith, who is acquainted with farming as well as more spiritual matters. It may be worth while to inquire a little how far it is likely or is not likely that the prosperity of stock farming is to be permanent, or is only due to temporary causes. There have been undoubtedly some temporary causes which have been affecting the markets of the country during the last few years, and prominent among these, of course, I need hardly say, there has been the late civil war in America, affecting very considerably, perhaps I may say largely, the price of wool, as it has done of all fibrous material in this country. I have no doubt whatever that a considerable part of the very high price which has been ruling for wool in this country during the last few years has been due, in a great measure, to the failure of cotton, and to those results which have followed from the great civil war in America. But, at the same time, we must observe that, although the American war has undoubtedly affected the price of wool, it cannot be said directly to have affected the price of sheep and cattle themselves. Now, it is a remarkable circumstance that for some time the price not merely of wool, but of the animals themselves, has been steadily advancing. There is, of course, another temporary and accidental cause which is affecting the price at the present moment, and that is the panic, if I may so call it—perhaps I ought rather to say the alarm, for it is too just an alarm—which has arisen in respect to the cattle disease. That during the last few months has no doubt further tended to increase the price both of sheep and cattle, and that also is, as we earnestly trust and hope, a temporary cause. But we must observe that, long before there were symptoms of a disease approaching, long before there was any alarm whatever in respect to the rinderpest, there had been a steady and rapid rise in the price of cattle and sheep going on for some years, and reaching a very high point during some months previous to the appearance of the cattle disease. We cannot attribute, therefore, either to the American war or to the cattle disease the gradual tendency to a rise

of prices in the markets for sheep and cattle in this country. To what, then, are we to attribute this steady rise in the price of the commodities which you are chiefly concerned in producing? I imagine there can be but one answer to that question—the enormous increase in the consuming power of this country. And here, again, although we may have had cause almost to feel ashamed that we should profit by the calamities of our neighbours, we come to see that our interests are coincident with the interests of all the rest of the world, because the increased power of consumption in this country is due to the enormous increase of its trade, and the enormous increase of its trade is intimately connected and bound up with the peace and prosperity of all other nations in the world. I have no doubt whatever, therefore, that so long as trade is left entirely free, as it now is in most of its branches, and so long as the capital of the country continues to be invested in the production of the goods which are necessary for consumption all over the world, and so long as peace and prosperity exist to us the markets of the rest of the world, the consuming power of this country will and must go on increasing. It reaches almost all classes. No one can have failed to observe that during the last few years the labouring classes of this country have been able to consume, and have been actually consuming, much more butcher-meat than they ever had before in any previous period of our history. That is advancing rapidly. Generally among the labouring classes of society people have been earning better wages; they have been able to buy for themselves better food; and that is the real source of the enormous increase in the price of the articles in question. So far as we know, there has been no diminution in the supply; but there has been an enormous increase in the consuming power of the country. The question of price is not merely, of course, a question of demand; it is a question also of supply—it is a question of the proportion between the demand and the supply with which it is presented to meet it. Now, with a view to the inquiry how the price is high, or at least remunerative, prices are likely to be permanent for stock in this country, the next question is, Given this enormously increasing demand, what are the sources of supply to which we must look? There can be no doubt whatever that, as regards corn crops, the effect of free trade has been to render unprofitable the cultivation of corn in many districts where it was profitable before; but, as regards stock, I really believe that the farmers of this country need fear no competition which can possibly be brought against them. We are unable of course to foresee what may be the inventions of mankind under the impulse of necessity; and it is just possible, quite possible perhaps, that methods may be found of so far preserving the immense number of animals which are annually slaughtered in South America, for example, almost solely for the sake of their skins, sinews, and fat—it is possible that there, and also in Australia, some method may be found to preserve the meat as to enable importers to carry it into this country in a fit state for the consumption of the people. You are aware that experiments have been made on this subject and that a considerable amount of public interest has arisen very lately in respect of what is called the charqui beef, or the beef of South America. I dare say much of it may be found fit for human food; but I cannot bring myself to believe that from this source there ever can be an effective competition against the flesh meat of our own markets. Then let us look on the other side of the water to the continent of Europe.

which is much more likely to supply us with fresh meat in competition with the stock produced here. There is already, as you are aware, a very large importation both of cattle and of sheep from the continent—an importation which no doubt will increase, stimulated and encouraged as it is by the very high prices now ruling in this country. But there are limits, I believe, to that supply, which make it, I think, quite impossible that that can ever bring down to an inconvenient degree the price of meat in this country. The truth is that we, in the British islands, enjoy advantages, as compared with other countries, in the production of stock, which are as great as the disadvantages under which we labour in respect of cereal crops. It is impossible to go over any part of the continent of Europe without being struck by the contrast which is presented between their parched and burnt-up grass in the summer, and the green, succulent vegetation of the British islands. And a great part of Europe, as you all know, is subjected to a very long and severe winter. There is a very small part of Europe which has anything approaching to the openness of the winters of the British islands. In short, the northern part of the continent is sealed up during the winter with snow, while another part in summer is burnt up by heat; and there is only a very small part—chiefly the northern portions of Holland, Belgium, and those countries of Schleswig-Holstein which have been so politically interesting during the last two or three years—which can be looked to for a great supply of butcher-meat for the people of this country. Now, whatever advantages are enjoyed by the British islands as a whole, as compared with the continent, are specially enjoyed by the West Highlands, as compared with all other parts of the country. We have a very moist climate, and we have what may be called perennial grass. We have a very mild winter. I have often been here in winter,

and I think I may safely say that the years are rare in which we have six weeks of snow lying on the low ground of this country. No doubt on the tops of the hills there is snow lying a considerable part of the winter; but the lower slopes of the hills and all the low ground are, during a great part of the winter and spring, entirely free from snow. Now this is an advantage enjoyed by very few parts of the country indeed. Even as compared with England, whenever we have a hot and dry season—and the last two years have been extraordinarily hot and dry seasons in England—I never come to this country from England, as I generally do in July or August, without seeing with ever fresh astonishment the greenness and richness of our pastures. They always remind me of the expression of the Psalmist, "Thy paths drop fatness; they drop upon the pastures." It is extraordinary the richness of the pastures in this country in a dry season, as compared with that on the continent, and even in England. While a great part of the pastures of England are extremely burnt up, I do not think there has been any drought in this country which could be at all injurious to the pasture. The hills were extremely rich in grass; the hay crops were very admirable, although not so abundant as in some years; and turnips, a failure over a great part of the country, seemed to me rich and luxuriant in the lower part of this country. In short, as regards the production of sheep and cattle, there is no doubt whatever that in this moist climate of the west coast of Scotland you enjoy advantages such as are enjoyed by a very small portion of the world indeed; therefore I say that, as far as regards the question of supply for this rapidly increasing demand for butcher-meat, I think you have advantages which, if they are well husbanded, will enable you to compete with any possible production which can be brought against you.

## THE DWELLINGS OF PIGS AND PEASANTS.

At the annual meeting of the Halberton Farmers' Club, a day or two since, the Rev. Canon Girdlestone, the vicar of Halberton, made a speech, in which he spoke of the value of such clubs, the improvement of cottages, the cattle murrain, and other kindred topics. He said one special subject which deeply interested himself, but had not attracted the remarks of any previous speaker, in some measure concerned the owners, and in another measure the occupiers, of land. There was no doubt that each had a share of the responsibility. It was a very important subject—he meant that relating to the dwellings of the labourers in the agricultural districts. He was enough of a farmer to know that if he wanted to have his horse in good condition he must give him a good stable, and in his stable place a good stall. He must have the stable well drained and well ventilated, and made snug and comfortable. He was enough of a farmer to know that the same treatment must be adopted, more or less, according to circumstances, with other classes of animals. The squire of the parish he held for many years in Lancashire, a man of old family, was an amateur farmer, and he bestowed his attention especially upon pigs. The pigs had not sties to live in; they had positive palaces, actually had a green park to run in, and were washed with soap and water two or three times a week. What was the result? Why the animals that were considered to prefer dirty habits became more clean in them, and grew so fine that the squire won prizes at almost every agricultural show in the county, and made large sums of money by his pigs. He was sure they would agree with him on the general principle, which they saw developed in every part of the country, that in order to have first-class animals they must give them first-class accommodation and a large portion of attention and care. Now, whilst they were all alive to that part of the question—and he did not believe there was a farmer present who would say nay to the principles he had laid down, as to the care that was taken of their cattle—he would ask them what was the condition of the agricultural labourer? He would ask them to compare many of the labourers' cottages with the stalls in which they stabled their

horses, the sheds in which they cared for their cattle, or even the sties where they housed their pigs. He had no hesitation in saying that in a great number of instances the brute creation had the preference over human beings. They might say what was that to them? the cattle were of importance to them, and if they did not bring them up carefully they would lose their profits. He, however, maintained that the housing of the labourer did matter a great deal to them in every respect. They could not expect to have a faithful, honest, intelligent servant unless he was well cared for, at least as well as the cattle on whom so much attention was bestowed. He took it that in many cases they could see the houses almost in ruins, with the roof like an umbrella which let in more rain than it kept out, with the floor so full of holes that the tidest housewife could not possibly keep it clean; a single room, in which there were sleeping together father, mother, and grown-up sons and daughters. He asked them what they could expect to be the result of that. It was not strange that their labourers frequently preferred the fireside of the public-house to their own, because their own was so uncomfortable. Many of their young women became mothers before they were wives, and had a herd of illegitimate children following them about, who had to be provided for at the cost of the parish. They must not be surprised at such results, for they were the necessary consequences of such a state of things. These matters were of great pecuniary interest to themselves, because it would increase the amount of their rates, which every farmer in the parish was constantly telling him was the only thing that stood in the way of improving their farms. But there was a much more important principle than that involved, for it must be remembered that there was a place where they had to give account for the moral and religious treatment of every single soul with whom they were brought into contact as masters. The present was an age of progress, and progress must be stamped on the very future of such societies as the present, and they might depend upon it that if they wished that parish to prosper they must progress also.

## STEPPE MURRAIN—ITS NATURE, PREVENTION, AND CURE.

Cattle are subject to four maladies known under the popular name of "murrain," viz.:

1. Vesicular murrain, or mouth-and-foot disease.
2. Pulmonary murrain, or lung disease.
3. Steppe murrain, or contagious fever in cattle.
4. Carbuncular murrain, malignant pustule, or Siberian cattle plague.

Of these several varieties of murrain, the 3rd—steppe murrain—is the subject of this paper.

Very little is yet known, scientifically speaking, of steppe murrain. A long experience has enabled political and agricultural writers, veterinarians, and medical men to talk fluently of certain outward appearances, and also of what they have seen and done. But the greater portion of this talk is unworthy of the appellation of science, strictly speaking; for many discoveries have yet to be made before the true character of steppe murrain is understood. Indeed no small part of medical science (in the common acceptance of the phrase), as applied both to man and our domestic animals, belongs to the same superficial view that is thus taken of this disease; and the reason is simply because Experience has hitherto been the master teacher. When left to themselves, instinct teaches our cattle, when ailing, to eat certain medicinal plants in their pastures, in order to effect a cure. And in the olden time medical men were not ashamed to follow the cattle thus grazing, in order to ascertain the medicinal properties of the plants in question, and then by experiment on themselves and their patients to follow up the most successful method of compounding and exhibiting such medicines. Up to a very recent period, an experimental knowledge of this kind was all that constituted medical science.

Of late years chemistry and the microscope have done much to throw scientific light upon the subject; but much more remains to be done before we know the medicinal properties of even our daily food—properties that are essentially necessary to preserve us in health. And with regard to the food of our cattle, our chemical knowledge in this respect is still farther behind. As to the malady under consideration—steppe murrain—we neither know its chemistry nor the chemistry of its prevention or cure, no remedial means having been discovered up to this date by experiment as above.

From these observations it will readily be inferred that our remarks on the nature, prevention, and cure of the contagious maladies that are now decimating our herds and flocks—and even ourselves, for two veterinarians have been cut off—must have for their object the reconciling of facts so far as discovery in veterinary science has already attained in the knowledge of this class of diseases, and the stimulating of further discovery so as to obviate the ruinously heavy losses now being sustained by the owners of diseased cattle.

First, as to the nature of the disease. The almost unanimous opinion of the veterinary profession and also of medical men both of this country and of the Continent of Europe is that it is the Russian "Steppe murrain," *alias* cattle plague, *alias*, in German, "rinderpest," which has been imported by some means or other from those provinces of the Continent where it is now raging. And, although this opinion has met with much opposition, the counter-arguments thus raised fall to the ground as untenable, being nothing more than the baseless fabric of a sceptical vision.

Of the untenable objections raised to the above professional opinion, the following may be instanced and briefly disposed of in this place:—

1. "The importation of steppe-murrain from the infected provinces of the Continent has not been established, and therefore it is not the disease." But the fallacy of this objection is so manifest as hardly to admit of a refutation; for those who thus reason the matter may as well argue that because the Ethnological Society cannot prove how a Cossack of the Don got to the British capital, he must therefore be an Englishman! In short, if the disease is Russian steppe-murrain, then it cannot be English murrain, and *vice versa*. And, with regard to the introduction of the former into this

country, it may have been imported in some one or other of the different kinds of corn and seeds, in wool, hides, tallow, and other imports of this kind from the infected countries: or it may have been imported in flax, or some other fibrous material, or in the wearing apparel of travellers, or of those engaged in commerce, or in manufactured goods, &c. While these several sources are practically investigated, the supposition will be that England has been so long in catching contagion from the Continent.

2. The second objection raised is, that "London and other large town dairies, cattle markets, and lairs, &c., are in such a filthy, over-crowded, pestilential state as to be capable of generating disease of a typhoid nature, and therefore the cattle plague now raging is in all probability of English and not Russian origin." We have for upwards of twenty years advocated strongly the general doctrine involved in this objection, as to the generation of disease at home, and to an increasing liability to the growth and spread of malignant contagious diseases. The concentration of cattle in the metropolis, as the concentration of the offal of slaughtered cattle, and the concentration of sewage gases in the capital, is a pestilential state of things enough to alarm the most obtuse observer; but granting this, and a great deal more in the same direction, the facts of the two cases in question are so totally different in London and in the steppes of Russia, both as regards cattle, climate, and produce, so that London miasms and steppe miasms and the typhoid diseases which they produce in cattle constitutionally different are also different, so that the existence of English typhus does not unprove the existence of Russian typhus (granting that steppe murrain is typhus), any more than the existence of malignant cases of British cholera proves the existence of Asiatic cholera. Hence the nature of the fallacy of the objection. In short, there is a much greater variety of typhus in cattle, as in man, than those who raise this untenable objection imagine. True, there is the possibility of the veterinary and medical authorities, referred to above, having mistaken the Russian plague for the English plague; but the hypothesis is a very unlikely and uncharitable one, and unwarranted by any facts which have come under our notice, for the pathological peculiarities of steppe murrain have been too well identified to be mistaken. At the same time, it must be admitted that the above authorities, and still more so the long list of Government inspectors, have manifested a somewhat conspicuous proneness to follow in the footsteps of the past, blind to those differences of circumstances which give variety to contagious diseases. But it is to be hoped that the breaking out of murrain amongst sheep, horses, and all kinds of stock will induce them for the future to examine diseased animals more closely through English spectacles; for if they do so they may ultimately find some half-a-dozen varieties, or more, of English typhus in each of our domestic animals, as something of this sort is absolutely necessary to reconcile the diversity of cases now recorded with one another and with any established laws of nature.

3. The third objection is not a very definite one, but it runs somewhat thus: "The contagion is in the air, and that blurs the philosophy of our veterinarians and medical men to the winds." When people leave *terra firma* for the clouds, it is seldom worth while to follow them. This method of battling the question belongs to the olden time; and before our ancestors had discovered the constituent elements of the atmosphere and its physical properties generally, it was doubtless admissible; but the modern lesson thus taught by the facts of the case simply inform us that the contagious matter, whatever it may be, is lighter or of less specific gravity than the atmosphere. And the information thus taught is of the highest importance, as it obviously furnishes one line of investigation for determining what the generating miasms and the contagious fomes of steppe murrain and the other varieties of cattle fevers are, in a chemico-physiological sense, assuming that steppe murrain is a contagious fever; for if this could be ascertained, preventive and curative discoveries would follow.

Further refutation of this old aerial dogma would be superfluous. The distance to which contagious matter can be carried in the atmosphere has not been determined. The example of Lord Syney's stock, viz., "three miles," although often quoted, will not bear a close investigation, for the contagious matter may have been carried this distance by dogs, foxes, hares, and rabbits—by rats, cats, weasels, and vermin of this class: by flies, or by various kinds of birds, as carrion crows, magpies, &c.; or the saliva of diseased cattle may have been carried this distance on the surface of a flowing stream or river, as from one drinking-pool to another. The ways by which contagion may be conveyed from one place to another are far more numerous than credited at the present time, and it would be well for the owners of cattle to make themselves better acquainted with the practical details of this view of the subject than they now appear to be; for the manner cattle have been purchased in open markets since the prevalence of cattle-plague was known, shows either a degree of ignorance or of supine indifference that is highly discreditable to both buyer and seller.

Some doubts may be raised as to whether steppe-murrain is truly a case of simple typhus; but until science makes farther discovery as to what typhus in cattle really is, and we may also include the question of what typhus in man is, so as to distinguish scientifically its different varieties, it would be premature to offer a word of comment on this head of the subject.

The period of "incubation," as it has been termed, is another question that is giving rise to much fallacy. The propriety of the term itself as applied to a putrid disease is a very problematical one; for it ignores the chemical changes that manifestly take place in the putrefaction of animal substances, and the new products formed under such processes in animal chemistry; while it solves the problem at issue and all similar problems physiologically, the living organism of the ox or sheep being metamorphosed (we use the expression for the want of a better) either into cryptogamic organisms so small as to be invisible to the naked eye, and of so low a specific gravity as to float in the atmosphere, or else into some sort of vibronic animal life, or *living stink*, so to speak, into which the body of the animal is finally resolved, and of which perhaps the less said the better, in our present state of knowledge; for when chemistry and physiology have made the discovery, thereby determining what respectively belongs to each, then we shall know the ultimatum of the matter. Meantime farmers have to deal with the contagious matter as an unknown poison, which if taken into the system is assumed not to play havoc for some ten days or so! Now, practically speaking, perhaps greater nonsense was never promulgated; for the contagious fomites begin to exercise their forces, whether those forces be vital or chemical, the moment they are taken into the circulation, assuming they are in an active state: if in a passive state, they will pass through the system harmless, if they are not changed in the digestive processes. In either case Nature will do her best to defend herself. If the health is low and predisposed to harm, *i. e.*, if the tissues and fluids are in an abnormal state, and exercise a strong affinity, or an attractive force, as the case may be, for the contagion, she will soon succumb under the former hypothesis. But if health is robust, and the fluids well supplied with those antiseptic, tonic, and other properties that exercise a repulsive force, the contagion will be powerless, so long as the system is kept in this robust state of health. On the other hand, if the contagious matter is deposited upon the coats of cattle, as in the hair of the ox, or the wool of the sheep, in an agglutinate form, as in the saliva or feces of the diseased animal, it may be there for weeks, and even months, and at the expiration of these periods be taken into the system of an animal predisposed to disease, in various ways—as by the contagion being liberated into the atmosphere, and thus be taken into the lungs; or it may be washed off with rain, or rubbed off, and mixed with the food, and thus be taken into the stomach; or it may be licked off with the tongue. Such being the facts of the case so far as known, the reader will perceive the difficulties that stand in the way of preventing the spread of disease by any system of quarantine.

The slaughtering and burying of infected cattle, or the "stamping-out process" as it has been termed, is another very unpopular method of preventing the spread of disease. The question involved is chiefly one of expediency, so that the facts

of the case must be the rule in each example. Personally, we feel a strong aversion to "the stamping-out process" rule; but until a remedy is discovered, the disease must be treated as an incurable one. In a few instances nature may fight the battle successfully, thus restoring a small per-centage of the herd or flock to comparative health; but in this example three considerations have to be estimated before a practical conclusion can be drawn. First, the reduced value of the recovered animals, present and future. If a fat ox or milch cow is worth £20 when infected—£10 when cured—and if after this it does not return one-half the value of the food it consumes, then the owner and the public may both sustain a dead loss. Second, if fifty per cent. of the stock die, then three-fourths of the value of the herd is the present loss. Third, if five animals had been infected at the outset, and if slaughtering these would have saved the remainder, then the owner's loss would have only been £100. Hence the practical conclusion. But the *if* in this example hinges upon a very nice professional question, which we believe has not yet been solved by veterinarians or medical men, viz., If the infected animals are slaughtered before they begin to give off contagious fomites, then the disease will be effectually "stamped out." Query, at what period of the disease does the discharge of contagion begin? The primary generating miasm is not contagion in every case, and therefore when the former is taken into the system it requires a certain time to play havoc and produce the latter: how long? Again, there is a period of time between the ingress and egress of contagious matter: what is the length of this period? To neither of these two questions can a definite answer be given; but it may safely be inferred that the periods of time are very different under different circumstances as to the nature of the primary generating miasm—the temperature and purity of the atmosphere, and the constitutional health, food, and physical condition of the animal when infected.

Public opinion in the discussion of the stamping-out practice has fallen into an egregious error, by assuming that the slaughtering of diseased cattle involves a loss of animal food, the reverse of this short-sighted and fallacious conclusion being the truth. Thus, for example, the food of the animals which they consume after they are recovered is, in point of fact, that which represents the animal food of the people, and not the carcasses of the animals when infected; for the cattle plague is unquestionably a great gormandiser of flesh and milk. And this, too, is not the most unfavourable view of the subject; for after animals have recovered, they do not pay for the food they consume, *i. e.*, they turn their food to bad account, while the quality of the meat or milk they yield is inferior. Add these considerations together, and the nature of the fallacy will appear manifest.

If, on the other hand, the disease is in an advanced state, and if the atmosphere is in a highly putrid and pestilential state from the discharge of contagion, and if the pestilence extends far and wide, then the slaughtering practice becomes more and more difficult to be carried out successfully, as other herds and flocks are liable to become infected.

Until a cure has been discovered (and even when it is) every attention should be paid to preventive means, and to prohibiting the selling of calves and lambs, so as to supply stock for the conversion of farm produce into animal food for the future; but into the details of this we cannot go at present.

#### A FIRST-PRIZE STOCK BREEDER.

**REMEDY FOR CRACKED HOOFS.**—Take a piece of copper four inches long and two inches wide, and drill eight holes, four in each end, so as not to interfere with the crack, and screw it fast to the hoof, crossways of the crack; then take a hot iron with a sharp edge, and burn the crack at the edge of the hair, till it goes through to the quick. After this let the horse run on pasture, and it will begin to heal up in a few weeks. This remedy I have tried, and it did the work complete, and I worked the horse all the time. Care should be taken to close the crack tight before the plate is fastened on. So says a practical farmer of Pleasant Valley, Ohio, in *Country Gentleman*.

## THE PIG.

*(Concluded from our last.)*

The animals of this variety of swine afford the best symmetry that can be seen of the pig carcass. The greatest degree of activity belongs to it that is exercised by domesticated swine, and it very much conduces to the health of the animal and the soundness of the flesh. The widening of the carcass has lightened the belly, and strengthened the legs, and thus have been removed the very general objections to heavy swine, the want of some degree of activity and of a sufficient leg. These qualities are possessed by the variety now described, as fully as may be consistent with the very glutinous and obese propensity of the hog genus of animals.

The improved pig of Berkshire is the most faultless of all British swine, none being more generally useful, or possessing so many points of excellence. The size is the smallest medium bulk; colour black, with white spots on the belly and flanks, with a tawny red tinge on the same places. This variety of colours shows a mixed descent from the pig of Naples and China, and the old and indigenous hog, with the tawny flanks and snout. No other pig possesses the general parts of the body in the same proportions of just adaptation on the same level distribution of fat and lean flesh over the carcass. This is a valuable distinction in producing an agreeable diet of animal food. The animal is most peculiarly the labourers' pig; convenient in size, easily maintained, flesh well mixed, and spread over the body; quick in fattening, and cheaply replaced. For small farmers, this recommendation is also to be applied.

The small breed of pigs has been obtained by crossing the least sized variety of the English improved hog with the swine of China. The delicacy of flesh has been imparted by the foreign swine, both by the Chinese and Neapolitan animals, as warm countries only produce pigs of that perfection. These animals were early imported into Britain, and the value was soon observed and appreciated. A continued use of the animals has stamped a variety of pigs in Britain known by the name of the small breed.

This variety of swine is mostly white in colour, as both the English hog and Chinese pig are nearly white. The delicacy is very great, that quality of the Chinese breed having been very largely communicated to the improved progeny of the mixed blood. The size is small, and the bulk diminutive; but the number of animals that can be maintained and fattened on a certain quantity of food, makes compensation for the want of size in the carcass, and for the weight of production. The great use of the breed consists in attending the young pigs for roasting, the quantity of flesh on the same bulk very far exceeds any other animal form. The most delicious fresh pork is also afforded by the small breed of swine; not only the delicacy of flesh suits that purpose, but the size and form of the animal join in constituting a most eligible article for the tables of the rich, and the secondary degree of domestic economy. For bacon and hams the use is small; the size is below that condition of being prepared, and the flesh is weak to be salted. The largest carcasses of the small swine are sometimes prepared for future use; but the common purpose is for fresh pork and roast pigs, in which capacity the breed is most admirably adapted. The breeding is mostly confined to the establishments of gentlemen farmers, who relish the fine articles in preference to value and profit. The breeding from near affinities has reduced this variety of swine to a very delicate existence—the hair or bristles has nearly altogether disappeared, and has been succeeded by a scrupulous skin, and a redness beyond the natural condition. This state is deficient in the constitutional vigour that is necessary to discharge the animal functions. The pigs of the small breed are exhibited in a very superior excellence on the Royal farms at Windsor, wholly white in colour, and of the large size of the breed, not reduced into delicacy, nor dwindled into insignificance of bulk. For fresh pork and roast pigs the animals are most superior, and afford small hams of much preference. A vigorous con-

stitution is shown, of which the want forms a heavy objection to many refinements of animals.

The three kinds of pigs that have been described, comprehend the whole classes that are used in Britain, and every modification of the animals can be easily referred to some of the kinds now mentioned. The quality of the flesh is an inseparable attendant of the animal condition in a large, a middling, or a small bulk of carcass. No other animal of the farm is so very pertinaciously this property, though it belongs in a greater or less degree to every animal existence. A near constancy of breeding very soon diminishes the value of the pig; the size is dwindled, and the constitution is enfeebled, the flesh loses quality, and the vigour is wanting which upholds the system, and enables the proper discharge of the animal functions. This invaluable quality must be possessed by all thriving states of animal life. An activity is also required, and a disposition to move about in some degree less or more. Some exercise promotes a healthy circulation, and assists assimilation and digestion. Though short and fine in the bone, the legs of swine must be sufficient to support the carcass; the head must be small rather than large, but not disproportionately reduced, as in some kinds of small pigs, the back straight and wide; the skin thick, fine, and gelatinous; coat glossy, without eruptions on the hide; hair or bristles rather thinly placed on the body, long, and fine to the touch, not coarse and harsh; neck short and thick, a great mark of the fattening propensity in all animals; cheeks full; body deep, compact, full and plump; ears erect, quick, pointed upwards, and not slouching forwards. Width of carcass is the chief essential of a pig; and breadth of loin and breast, a cylindrical squareness of form with a near uniformity of size, and an abundant propagation. A refined delicacy loses the robust properties which constitute a prosperous existence: to combine the conjunction of the double inheritance is the grand object of all profitable breeding.

The most eligible production of improved swine in Britain may be found among the animals of the white colour of the middle-sized breed, with a good coat of hair in bristles, of a fair length and quality, and fine in the pile. Black pigs are finest in the skin, are less subject to diseases of the coat than white colours, and are less affected by the rays of the sun, but the white skin is most pleasing to the eye in all flesh that is used with the skin unremoved, as with swine and poultry, but this objection does not much prevail. The great preference of the middle-sized breed consists in affording roasting pigs and fresh pork in the young condition, and large hams and bacon in the matured age. These purposes being duly served, affix a value that requires no further demonstration.

The very large consumption of the flesh of swine as an article of human food, in the fresh and salted condition for the domestic use, and in the latter state as an article of exportation, and for naval stores, attaches a very great importance to the breeding and management of pigs over the United Kingdom of the British isles. Every quantity of land in the hired cultivation of the extent of 500 acres and upwards, of which a fair portion is capable of producing crops of roots for winter food, should be arranged to constitute a regular manufactory of prepared articles of sale, breeding, and fattening the number of animals that can be maintained on the extent of ground. Among the animals that are thus entered into the use of the farm, the pig holds a place that is equal to any other of the articles that are manufactured into value. The accommodation given to swine must be adequate to serve the purpose of separation, rearing, and fattening: the houses are low to suit the stature of the animals, and the yards are less extensive than for cattle. The systematic arrangement of managing animals requires that each kind be separately accommodated, and the low bulk of swine demands this removal more than the larger animals of the farm, but which are treated with separation. In the management that is now to be detailed, the piggery is wholly separated from the fat-



very, but still adjoining to it, and forming a part of the rection.

A small piggery is required to suit the small extent of farms, accommodating one or two sows for breeding and the offspring in the store and fattened condition. A house contains the food for application, sties for fattening two animals in each division, a yard for store pigs with sheds for shelter, and a pond of water in which to roll and wallow. The food is roots, wheys, and boiled potatoes in the yard, with clovers and vetches in summer, and roots during winter.

On farms 300 acres and upwards, a boar and three brood sows are accommodated in four sties, placed on the end of the re-house, and forming with it the width of the piggery; the stinging is in an open yard and a covered shed, being the best accommodation yet devised. The young pigs are nursed by the sows till grown, castrated, and weaned, and then turned into the store yards, fed during summer with clovers and vetches, and in winter with turnips, potatoes, beet, and cabages, but chiefly with raw potatoes. Ample littering is supplied in the rough straw dung from the stables, which affords a warm bed for the pigs, and will produce a large quantity of dung in the store-yard, which is provided with shelter-sheds against the inclement weather, and a central pond of water in which the pigs delight to roll and wallow. There is a double row of fattening sties for two pigs in each apartment, into which the animals are drawn from the store-yard as required to be fattened. This is done by means of cooked food in steamed potatoes mashed with meals, and prepared in the fire-house, cooled in vats, and carried along the pavement road between the rows of sties in a light four-wheeled iron waggon, and delivered by a spade through the spout-holes into the troughs placed for the pigs in the open yard. Two meals-a-day, in the morning and evening, will suffice for short days, long days will require three feedings. Experience has shown that of all farm animals, pigs are most benefited by cooked food; and it is rarely used, except during the last month of feeding. One meal is given, in dry grains, of beans, oats, or barley, in order to consolidate the flesh, and bind the muscular frame. Beans are most useful, as the seeds contain the tannin principle in the pericarp, which binds the fibrous bodies into a more firm consistence. The average progeny from three brood-sows may be sixty pigs yearly. Two lots of fat pigs, sold yearly from the sties, will be about fifty. The surplus pigs are sold as lean stores. The fire-house is floored, to contain the meals and grains: the roots and steaming-vats are on the ground-floor. An end-door in the house passes the cooked food, along a pavement road, to the boar and brood-sows, which latter are amply fed during the suckling season with liquid food, as milks and wheys, thickened with meals. Such an establishment as now described will employ part of the time of the cow-man and lad both during winter and summer. Water is brought to the steaming-house in pipes on some higher position; and meals and roots are in a convenient access. The fattening season begins with the month of October, and ends with March, allowing two fattenings of pigs, as the animals are always in a very forward condition in the store-yard, and ready for the feeding-sty.

It is beneficial to allow some few store pigs of a small size to live in the cattle-feeding yards, and roam at pleasure from place to place, picking up for food the crusts of turnip-bulls that are refused by the cattle, and the grains that may come among the straw and escaped from the scutchers of the thrashing machine. Some few turnip-roots or raw potatoes being given to these stray inhabitants, will assist the growth, which is much promoted by the nestling of the pigs in the yard adjoining the stable, of which the litter is discharged in a rough condition, with the warm dung of the horse, and is very agreeable to the nature of swine. It will be advantageous that the yard next to the stable is wholly adapted as a store-pig habitation, and provided with the necessary water and troughs for containing the raw kinds of foods. A manure of most excellent quality is thus manufactured; the cold saponaceous excrement of the pig is mixed with the hot fermenting dung of the horse, which corrects the extreme quality of both substances into a medium of a better nature. The labour of swine with the amount is almost incessant, by which the excrementitious substances are minutely reduced and most intimately blended. The manufacture thus one exceeds all hand-mixing of materials. If this yard is not formed adjoining the stable for store swine, the straw dung

of the stable is carried to the store-yard of the specially-designed piggery, as is now represented, and spread as litter evenly and regularly over the surface, when an excellent mixture happens of the hot and cold excrements, which are corrected into a medium quality of a very great value and of a large quantity from the straw afforded as litter. Much of the profit derived from swine arises from the bulk of the most excellent manure that is made by the animals, when duly accommodated and provided with food and litter. No animal of the farm is so useful in that respect, nor does any quadruped void so large a quantity of solid and liquid excrements in proportion of the bulk of carcase. The organs are fitted for quick digestion, which induces a voracious appetite, that is little discriminating; but a general devourer of juicy articles and rejecting dried forage, as the animal does not ruminate. The variety of food consumed by pigs imposes little trouble in the preparation.

Pigs are very multiparous, the gestation of the female being often considerably advanced before the preceding litter is weaned. But the simultaneous processes of breeding and suckling are too severe to be supported by the animal, and the progeny is best restricted to two litters in the year, which gives some recreation between the bearings, as the production is in seventeen weeks after impregnation. A very numerous progeny is not eligible, being often puny and delicate; eight, and not exceeding ten pigs, are the best litter, when the chance is of being strong and healthy. Sixteen pigs from a sow yearly are better than twenty-four, when deaths will be more frequent, and the lives less robust. During the time of suckling, the sow requires a very attentive supply of juicy and liquid food in milks and wheys, thickened with barley-meal; water alone may be used in forming the thickened warm food, and assisted by the liquids of the dairy. On the pigs being weaned, dry food, as oats and beans, are given to the sows for the purpose of promoting the salacity, which is much forwarded by that application. The pigs are allowed for a time very ample food in broths and gruels made with warm milks, wheys, and water, thickened with meals of beans, barley, and oats ground and mixed for the purpose. When parted from the sow, it is beneficial that the pigs are confined in a shed or sty, in order to feed for a time with food similar to the milk of the udder, and have a part of the food of the store-yard to learn the eating of the fare to be used when turned into that congregation. Being thus strengthened by age, and accustomed to the food, the transition will be easy from the sty to the store-yard, and inflicts no damage on the progressive growth of the animals. The fire-house for cooking the food gives much convenience in providing warm meals for the special purposes of the piggery. In small establishments the kitchen of the farm-house will afford those warm provisions, and the piggery is placed at a near distance from the back-door of the kitchen. In that case some vats are placed to receive meals and dairy wash, which become thickened by remaining, and being again made thin with warm liquids, a healthy food is prepared for pigs of all ages. The cooking-house, as seen in the design now shown, supersedes this necessity; but these erections suppose large establishments and a systematic management, both in breeding and feeding the swine. The same rules are to be observed in every case of feeding pigs; the largest establishment is only a greater extent of the smaller practice, varied in some points of application by the more ample means that are afforded, and the number of animals that are to be provided with food and accommodation. These differences cause some deviations, but still attached to the main purpose.

It is acknowledged, almost without a single doubt being expressed, that pigs, before all other animals of the farm, produce the largest quantity of flesh meat from the food that is consumed, and that the pig eats the greatest variety of food which is the least troublesome in the preparation of use. With the exception of dried forage food, as hays and straws, on which articles alone cattle and sheep are not readily fattened, swine devour promiscuously almost every leaf and root, rejecting little, and consuming very largely. In the store condition of the animals, raw food is preferred, as the juice is required to distend the growth in the fattening process; cooked food is required in order that flesh may be easier and more speedily formed. Even in that condition grains are found necessary to impart firmness to the flesh, and bind the fibrous texture of the animal frame. The experience is ample, and is daily

practised, of rearing and fattening swine in much perfection with unprepared roots and grains, and without any confinement of the animals; and as the process of fattening is slower, the flesh is firmer, and more fixed and concentrated. This mode can only be done on a small scale, and with a few of the animals to be bred and fattened; the extensive manufactory of swine demands a separation of the age and purpose of the animals, and the accommodation necessary for the receiving and fattening being done in a separate combination.

The meal of barley fattens pigs better than any other food that is known, the great quantity of starch, about 60 per cent., producing a larger portion of fat in the animal than in any other fattened carcase. The proportion of fat to lean is produced by the pig more largely than by any other animal, and by barley-meal better than by any other food, though it contains very little oily matter, and is superior to oilcake, or any other food of the kind. The pig sleeping in the shed after a full diet of thickened barley-meal in the yard, solves the problem of chemical philosophy on the conversion of starch into fat. But the peculiar organs of the pig are required for the process, as barley does not produce the same result with any other animal.

No fattened animal is so extensively spread in the use as the pig; the ox and the sheep are only kept on extents of cultivated lands, and by the cultivators themselves, whereas the pig enters into every human dwelling, and becomes a part of its furniture. The size of the animal suits the convenience of any habitation; the food, both in quantity and quality, is within the reach of almost the poorest inmates, and the unscrupulous taste of the pig is adapted to the little variety of food that can be afforded, and the limited means of procurement. On small farms the use of swine is very great, being in many cases the chief support of the establishment, especially when near to the demand of towns and naval stations. In these cases, the management is more regular and systematic, though on a small scale, than on more extensive farms, where cattle and sheep are more favoured as fattening stock at least in the fair ratio; the breed is kept, and the progeny reared into forward stores, or fattened into bacon. The demand is found to suit the use of the flesh, and the attention is consequently turned to that article as a manufactory of farm produce. In this way the root crops are advantageously disposed, and the profit is found to be very considerable.

On dairy farms, where the produce is large in milks and wheys, pigs are indispensable consumers of these articles, which no other animals of the farm are adapted to use. Pigs are consequently very extensively reared and fattened under these circumstances. The liquids of the dairy in the thin mixture with meals nurse the young condition into small pork; and the thicker food of meals and milks fatten the animals, with some raw grains to finish the process. A very large quantity of animal food is thus produced, and from articles that, but for pigs, would be altogether lost and thrown away, which consideration very much raises the value of the pig as a domestic animal to be reared and fattened. The variety of its food comes here into a very large consideration.

As the flesh diet of the labouring class of society, pigs are far the most useful of all fattened animals, and not in the cheapness of the flesh, but in the way of its being procured by the poor inhabitant of the cottage. If not a piece of rented land, at least a garden ground is attached to every human dwelling. In thickly-peopled countries of labour on the farm, a quantity of potatoes growing in the farmer's field forms a part of the yearly wages, and also a cow kept on the farm, which belongs to the labourer or the farmer. The vegetable produce of the garden, the potatoes of the field, and the milk of the cow, all produce a food for the pig, and in remnants that could not otherwise be used, but be lost in any application. Accordingly, it is essential that every cottage have accommodation for a pig, in which the animal can live and be fattened, and by the usual arrangement of two in a year, or three in two years. Two small pigs of the middling breed in the year will best suit the poor man's purposes. Equal in use with the milk of the cow to the young family of the labourer, the flesh of the pig may be a more substantial diet to the working part of the people. The offals afford a fresh meat, and are made to last for a time: part can be cured; while the hams and bacon afford a ready, wholesome, and substantial food throughout the year. It is this readiness, and the mode of procuring the meat by the home-fattening of

the pig, that confers the very especial value on the animal for the use of the labouring population. The home production of it, with the articles of the wages of labour, prevent the market purchase of flesh, and affords a recompense that is beyond the value in money. The bulk of the pig is convenient to the purpose of the cottager: the variety of food suits the animal suits the means of maintenance; and the quantity of flesh produced from the food consumed is not equalled by any other animal, and no other flesh-producing quadruped relishes the food of the pig, which would be altogether unsuited but for the swine to consume it. The flesh of the pig is almost the only animal food within the reach of the labouring population. Being manufactured at home, the money is not wanted for the direct purchase—it is ready at all times at home, and carried to the field of labour; and, being generally nutritious, it is never refused by any fastidious liking, or reserved to please any unreasonable choice. The harmony of the hearth and domestic contentment are very much promoted by the ready article of bacon in the cottage of the labourer. The wife is pleased to have a ready meal for all demands; the husband reckons on a supply that never forsakes his side. The provision does more to prevent marauding and poaching than whole volumes of penal statutes. The tame and supply the want of wild ones, and exhibits the social example of competency, preventing crime, or, rather, an usurped prohibition. At all events, the provision of competence is to produce the expected results.

The pig is a most general cosmopolite, inhabiting a great variety of climates; and in no locality is the domestication refused by Nature, provided the food in some kind or quality is afforded, and the necessary shelter erected. Cattle and sheep have their peculiar likings, which must be gratified in order to obtain a profitable use of the animals: the kinds of the animals must be adapted to the influences of the climate and the capabilities of the soil, along with the general surrounding circumstances. But the pig does not require any large consideration for its maintenance. The support is easy, and the accommodation inexpensive; and for its general usage no particular provisions have to be regarded.

No description or notice can be formed of the animals of the farm without a very large and varied estimate being made of swine, as constituting a most important and very considerable portion of the fattened produce of cultivated lands. The nature of the food consumed by store pigs, both in the quantity and quality, forms a very great recommendation; and the variety of general aliment is a property of swine that exceeds every other animal, and is almost exclusively confined to the pig. This quality, along with the easy adaptation of the animal to the circumstances of influence, much advances the estimated value of swine. The convenience of its use in small habitations, the quality of the flesh, the quantity produced from the kind of food, and the very procreative faculty of the animal have fixed a natural value on the pig, that cannot be challenged, nor can be in the least degree impugned. Practical opinion never exhibits two sides of the question, and every written record bears testimony of the universal contentment. No fattened animal produces so much flesh for the same quantity and quality of food that is consumed; it does any other beast carry the amount of meat on the same quantity of bone that forms the carcase of the pig. In these respects the pig exceeds all other fattened animals of the farm.

**CLEAN PIGS AND DIRTY PIGS.**—Pigs enjoy the reputation of having a real liking for dirt; and, certainly, the way in which they are kept on some farms would show that the owners are determined to give them ample opportunities for enjoying out this liking. No notion can, however, be more erroneous than this, as none is certainly so productive of loss to the keeper. Let any one not convinced of this try the two modes of pig-keeping—the dirty and the clean—the food in both cases and other general treatment, being the same; and the result will show him which of the two is the best in the end. A great deal depends upon the mode in which they are housed. Mr. Raine of Mills, adopts the following:—A large outhouse is enclosed on the sides, so as to be warm and dry. The floor is paved and sprinkled over with burnt clay, and ashes obtained by burning

weeds. In this the pigs are fed; while for resting and sleeping they have a compartment railed off at the other end, and which is amply provided with clean straw. In another case, the principle of box-feeding has been applied, the pigs being kept in a pit, into which the manure from the ox or cow stables and the horse

stables is put. The pigs tread this down, and enjoy themselves amazingly. In one case, where this plan has been adopted, the farmer states that his pigs "have given him a profit by their meat, and left the dung—as good as guano—for nothing."—*Scottish Farmer*.

## ON THE SANITARY STATE OF TOWN DAIRIES.

The common practice pursued in the management of milch cows in the metropolis and our other large towns is a long way out of date. However spacious buildings may be, even granting that cows were housed in separate apartments, and these equal in architectural style and dimensions to the best rooms in Buckingham Palace, and the dietary free from objection, the smoky, dirty, polluted atmosphere of towns, and the noisy turmoil, together with the other *ceteras* involved in town life, are incompatible with the sanitary requirements of a milch cow. Very little requires to be said in order to prove that the manufacture of milk is a work that imperatively demands the pure air and comparative retirement of the country, the full enjoyment of the blessings of country life in this respect being no less essentially necessary to the health of milch cows than it is for the health of the inhabitants of large towns and the pecuniary interest of cowkeepers, because upon such depend the quantity and quality of milk, the profits of the dairymen, and the health of their customers. And these data apply with as much force to the cows of private families as to those of public dairymen. No doubt, in both cases, many establishments could be pointed out, in which cows are in good condition, and in the enjoyment of apparent good health, and yielding, at the same time, an abundant flow of thick milk, as indicated by the lactometer.

We have on more occasions than one been told this, when reasoning the matter with the cowkeepers themselves, while examining the dairies of the British capital during the last eighteen years. But it must be borne in mind that fatness is no true index of health: much less does the lactometer give a true indication of rich milk; for, when we appeal to the books of cowkeepers, they prove, without a single exception, to the contrary—that milch cows in the capital are short-lived animals; while the specific gravity and thickness of cream are due to an excess of saline and abnormal fatty and other matters that rise to the surface of the milk when kept to throw up cream. To those who know no better, such milk may "pass muster;" but it has precious little of the flavour, general richness, and nourishment of country milk, when the cows are properly fed on natural food. In short, healthy suburban detached residences for the milch cows of the metropolis have become as essentially necessary in our social economy as suburban detached residences for our "city princes," and in both cases for similar sanitary reasons.

Season tickets for cowkeepers with their milk-cans a few miles into the country twice a-day will be no new proposition ten years hence, but an established realization in the march of improvement. In point of fact, it is so at the present date. There may be a greater variety of ways in carrying out the proposition into practice than at present; but the progress of the general principles involved in the enunciation are daily becoming more and more a matter of certainty in the general economy of the trade; for the conveyance of milk in from the country twice a-day is a practice that is rapidly increasing; and were landlords and their tenants to turn their attention more closely to the defects of town dairies, the requirements and increasing demands of towns, and to the establishment of dairies on the most approved plans at all the railway stations along the various lines within the limited distance of milk conveyance, the supply of genuine country milk would soon supersede altogether the crude, abnormal, saline produce of intramural dairies. Towards the circumference or inner circle of the suburban districts, cowkeepers may rent a small paddock each, for example, or purchase the fee-simple, and, upon these, erect proper household accommodation for their stock, and then bring in milk in their own carts. But in the more central districts of the metropolis the progress of things rather indicates a more extended subdivision of labour between town and country—the former (the town branch or division

of the trade) being confined exclusively to the retail commerce of milk, in supplying milk-walks with their demands twice a-day; while the labours of the latter (the dairy farmers of the country) will be exclusively confined to the produce and wholesale of milk, including its regular conveyance and delivery in town. In other examples, a large dairy-farmer in the country may open milk-walks in town, and thus bring in his milk by rail, and retail it daily; and we may add that the examples already in existence of each of these plans are too numerous to be mentioned individually.

This, however, is not exactly the principal view of the subject to which we wish more particularly to direct our present observations. Enough has been said to show that the removal of town cows to the country involves a great work of progress in the supplying of the metropolis and other large towns with an abundance of wholesome milk. While, on the other hand, the special object of our remarks that follow will further show that the growing prevalence of contagious diseases and the heavy loss generally sustained from a low degree of health, and the consequent ruinous tear-and-wear upon cow stock, more especially in the metropolis and a few other towns, will compel cow-keepers to remove their stock to the pure and unadulterated atmosphere of the country, and to adopt a more natural system of dietary than is now in force. The heavy mortality amongst milch cows, under the cattle plague now raging, and the liability of milch cows to be affected by typhoid diseases, when confined and fed as they are at present in a close and impure atmosphere, are such as to justify the prohibition by statute of keeping milch cows within—say, for the sake of argument—a five-mile radius of St. Paul's at this date. This limit to extend as the area within this circle is filled up with buildings; the statute to apply to all other towns. In short, Parliament must interfere, and compel town dairy-cows to be kept in proper buildings in the pure air of the country, to be fed on proper food, and to be free from crowding and the other proximate causes that generate pestilential miasma, muscular and nervous debility, and finally typhus fever and other contagious diseases. It will also be necessary to prohibit milch cows and young dairy stock from being bought and sold in the metropolitan cattle market, and in all similar cattle markets, where crowding and exhaustion are experienced.

It will be no easy matter, judging from past experience, to bring the cow-keepers of the capital to subscribe, either to the growing necessity of a country life for their cows, or to the propriety of statutory measures to enforce the practice; and the same may be said of the cow-keepers in all our other large commercial and manufacturing towns. We can readily imagine, for example, a thousand objections being raised to both propositions, based on the inutility of the former and on the arbitrary unconstitutional character of the latter. But when such objections are examined from a practical and scientific point of view, they only amount to a humbling degree of ignorance and prejudice, with innumerable antiquated habits that are fast giving way to the improved practices against which those very objections are levelled. Thus, it will be argued that dairy-stocks, beyond the five-mile circle specified, have suffered as much from the cattle plague now raging as those situated within that radius, and that cows in the latter examples are just as healthy and free from any predisposing cause to typhus as cows in the former, and therefore the practical conclusion will be drawn that it would be both unreasonable and unjust to remove cow-keepers the long distance of half-a-dozen of miles from their milk-walks, as such would amount to twenty-four miles daily. But however closely tied down and professionally blind certain classes of the community may yet be to antiquated prejudices and short-sighted habits in the daily routine of their affairs, and however barbarous may be their notions relative to the dietary and health

of horned cattle, all who know anything experimentally about town life and country life in a sanitary sense, and the physiological requirements of a milch cow, must perceive the fallacy and untenable character of such objections to the improvements in question; for, granting that country dairies are badly managed, that does not prove town dairies to be conducted in the most improved, economical, and profitable way. In short, both town dairies and country dairies are subject to vast and needful improvements, as much for the profit of the cow-keepers themselves as for the health of their cows and the pecuniary and sanitary welfare of their customers. If it is true, as political journalists generally argue, that the cattle plague is neither less nor more than typhus generated in the London dairies and cattle markets, including its lairs, &c., then the practical inference to be deduced is manifest, for cow-keeping and marketing are in a very rotten state, and the losses now sustained by London cow-keepers no more than what they justly deserve. But whether the cattle-plague was generated in the London dairies, or imported from Russia in live-stock or agricultural or other produce, from the Black Sea or Baltic, or from Egypt, the East Indies, &c., is only a question of degree; for, according to the former hypothesis, the rotten state of the London dairies is the generating cause, while, according to the latter, it would be the predisposing cause—assuming always that the steppe-murrain of Russia is in verity a typhoid disease, produced by pestilential miasmata, and not a nervous, spasmodic disease, produced by the sting of an insect, as the "tsetse" or the like, under a vitiated state of the solids and fluids; for there cannot be a doubt that the food and general management of milch cows in the dairies of London, and in many country dairies also, are sufficient to produce the predisposing cause—muscular and nervous debility, and, next, typhus fever itself. Now most medical men, who have studied the prevention and cure of typhus in man, must be perfectly aware that, in the former case, pure air, a generous, wholesome diet, and plenty of breathing-room, more especially over-night, in the absence of the stimulus of light, and under the lower force of vitality during darkness and sleep, form the rule—conditions wholly incompatible with town dairies. Consequently, cure, or rather, the assisting of Nature to cure herself, resolves itself into a very hopeless task, if not an absolute impossibility, in the overcrowded area and confined, polluted atmosphere of a London dairy, and, we may add, the vast majority of country dairies also, and even the open fields of the country, when management in other respects is defective, and the system, consequently, in a vitiated state.

The secretion of milk is a natural process that involves a large amount of nervous action, and, consequently, wear and tear of the whole system. Hence the reason why great milkers consume a large amount of food, and why they are, nevertheless, thin, being often compared to "nothing more than skin and bone," and why they are so soon worn out. Hence also the reason why milk-cows are so easily agitated, and even irritated, by any exciting cause from without or from within, as by a change from a rich to a poor diet, and the like. The change of a cow-man, for example, or the change from one place to another, as when sold in market, has been known to put some fine milkers almost dry for a short time, although the change thus experienced by them was in every other respect to the better. Not only, therefore, do milch cows require pure air and a plentiful supply of rich natural food, but also the most gentle and uniformly-kind treatment that can be given them; and perhaps no creature in the world is more sensible of such kindness, or more thankful for it, her sole

pleasure, as it were, being to labour night and day in order to return her owner the greatest possible remuneration, both as to quantity and quality of milk.

The function of a milch cow is thus a very interesting proposition, but one that is very little understood in a scientific sense, or attended to in a practical one, by the vast majority of cow-keepers. This is much to be regretted, no less on their own account than on that of the general public; for the upshot is, that not more than half the quantity of milk is consumed that otherwise would be used, were milch cows treated according to their physiological or natural requirements, so as to produce rich, well-flavoured, wholesome milk.

Although the cow is naturally the habitant of low-lying pastures, and will even wade to the knees to obtain the succulent grasses produced by springs and flowing water, she is nevertheless extremely sensitive to a pure atmosphere and dry bed; for, after she has filled her belly with such grasses, she will go a long way to obtain her natural wants in both these respects—viz., a dry bed and pure atmosphere, in which to lie down, ruminate, and fill her udder with the rich beverage she yields as the produce of her industry.

How different is the experience of the milch cow in the British capital, even in the most favourable examples! the whole system of dairy management, if system it can be called, being diametrically opposed to her natural requirements. To say that John Bull had offered a golden medal for the most effectual system of generating typhus, and that the cow-keepers of the capital, one and all, were competing for the prize, may be considered, perhaps, an exaggeration; but it nevertheless embodies a very faithful exposition of the facts of the case. True, pure air in London cannot be had for any money. But is not this the very key to the true solution of the problem? for if a proper site is chosen, pure air can be had in the country for nothing. And even in the country, pure air in a cow-house is a much more comprehensive question than is generally imagined; for milch cows require a much greater amount of household accommodation than they now receive, or what is now proposed for metropolitan cows—viz., 1,000 cubic feet; and when sickness occurs, they require a still greater area of house-room, as compared with ordinary occasions of health. If cow-keepers will only visit our hospitals and measure the area of house-room apportioned to each patient, and then multiply that area by ten, for the requirements of a milch cow, they will at once perceive the force of our general argument, that to erect buildings in the capital, suitable for cows during the typhus-brewing months of summer, is an absolute impossibility, practically speaking; for it is in the country, and only in a few select parts of it, that milch cows can be accommodated with those atmospheric conditions they are essentially necessary to their health and the secretion of a plentiful yield of rich milk.

The work of improvement is evidently one of degrees, even granting that statute law should interpose to enforce its completion within a given time. But, whether Parliament interferes or not, the work is already in progress; and the sooner it is finished the better for all parties interested. Short-sighted cow-keepers may conclude otherwise, and cling to their antiquated and unhealthy cow-hovels until a diminishing business compel them eventually to sell out for a "last whistle;" but the cattle-plague now raging will open the eyes of the more thoughtful to a timely sense of future duty and interest; and it is to be hoped that, upon the whole, this will be the general rule in the British capital—the securing, without delay, of healthy paddocks near railway stations for dairy homesteads,

## IMPERFECT RIVER DRAINAGE.

The season reminds us of the expression of sympathy we again owe to those of our fellow-creatures who are doomed to live in our undrained river valleys. The populous low grounds of the Ouse may be taken as an example. Here we have the two county towns of Bedford and Huntingdon whose inhabitants must of necessity suffer seriously from the present state of that river. Kimbolton, with Kimbolton Castle, the

baronial residence of the Duke of Manchester, situated on one of its tributaries—the Kym—is, perhaps, worse than either; while hundreds of cottages, besides other towns, villages, and hamlets, are about as bad as bad can be. Looking down from the high grounds into this valley, as we have frequently done about daybreak at this season, and casting the eye along the slumbering fogs in which so many human beings uncon-

scionally spend almost every night, and sometimes the greater portion of the day, and then turning to the chemical question which such a state of things involves, "one's flesh," to quote a rather common but significant phrase, "begins to creep upon the bone" at the thought of consequences. Fortunately for many of those who live in such low-lying districts, very little is yet known, chemically, by them of the direful influence of the pestilential gases that arise from decaying animal and vegetable substances, and the peculiar agency of these fogs in the production of disease. When those accustomed to breathe the pure atmosphere of higher levels descend into such miasmatic grounds, they feel a sensation not very easily described; and, when they return home, they again experience relief: but the inhabitants who reside constantly in such districts are not sensible of what they actually experience, owing to the effects of habit upon the constitution. They are, however, by no means exempt from suffering, although unconscious of the proximate cause of their malady. There may be a general credence in the district that the low standard of health is attributable to its impure atmosphere, and that this impure atmosphere is caused by stagnant water from imperfect drainage. So far is mere traditionary "hearsay," handed down from time immemorial; but ninety-nine out of every hundred know comparatively nothing of the chemistry involved in such phenomena, or they would not sleep a single night in such low-lying pestilential habitations, at least those of them who could afford to rent a dormitory on a higher level—one beyond the reach of the noxious gases.

The case is a very strong one, involving not only the violation of one of nature's laws, but also the expiatory punishment which such merits at the hands of Retributive Justice. The loss is heavy, falling not less upon the purse than upon the person; for, while the bills of the family doctor are high, incomes are low, and the labouring population so enfeebled as to be unable to do a day's work; so that labour is much more expensive than it otherwise would be to employers. Horses and working cattle are similarly unfit for duty; while the loss on breeding and fattening stock is, in many situations, very heavy; consequently, the sum total of the losses on both sides is something considerable.

It is a matter of much regret that the proper steps have not been taken to estimate these losses practically. Were those interested sensible of the loss they thus sustain annually, more would be said about river drainage, and the imperative necessity of its being thoroughly executed without delay or any regard to the short-sighted and selfish opposition that is often allowed to stand in the way as an effective barrier. This is no less applicable to landowners, farmers, and their labourers, than to the inhabitants of such towns as those already mentioned. The dogged indifference with which both town and country entertain their respective positions in this respect is certainly highly reprehensible. It no doubt arises from the sacred regard which in this country is extended towards private interests—to the peculiar doctrine generally entertained of the inalienable rights of land, especially the more valuable "nooks and corners" occupied for manufacturing and commercial purposes, and to the somewhat easy manner we take the invitation to rise and go along with the times. But although such a spirit may be highly commendable in every case where it accords with public and private interests; yet in the example before us, it has long ceased to be applicable, every obstruction to river-drainage having out-lived its day and generation, any claims to rights appertaining thereto being nothing more than the last struggles of nature in throwing off the mortal coil—the unconscious movement of the foot and leg, as it were, when the heart has ceased to perform its functions—the remains of what was once a noble structure of great public and private usefulness, but which has now ceased to live, and must therefore be consigned, like other remains, to its final resting-place, in order to make room for the offspring of the present age.

That mills, canals, bridges, and the other ninety-and-nine nameless obstructions to river-drainage were great things in their day, is now matter of historical fact that admits of no proof to the contrary; and more than this, for there is something so genuine about the old mill and its appurtenances, the canal sluice, the barge and its companions, &c., however antiquated they may be, that, when gone, will be missed by many a friendly eye to thorough drainage. When that day comes—and come it must—it were difficult to anticipate the

theme of the poet or the shade of the landscape-painter. No doubt new scenes will arise in place of the old, each possessing its own meritorious charm to the artist and the lover of the picturesque; but the old lordly willows that have enjoyed the admiration of more generations than one, with the old millers and their mill-carts, will be nowhere to be seen. These, with a long list of splashing mill-wheels and the busy train of canal-craft, will have ceased from entrancing our imperfectly-drained valleys with their bewitcheries, and for them a modern bard may sing of "passing clouds shedding tears," or artist's pencil portray some chaotic exegesis of the passing moment; and what is more, we can well afford to sympathise with all who may thus be called upon to experience affliction or bereavement of this kind before the change has actually taken place. Up to the last hour of the present drama this is no more than natural; but when once the curtain falls, and new bridges begin to span our rivers, leaving a clear water-way, from source to confluence, for thorough drainage, the new scene will not be devoid of its engineering and agricultural attractions, and to these we must now proceed to turn the reader's attention.

It is only when our river valleys are properly drained, and the profits of the new system have begun to flow in, that our present losses can be practically estimated. In other words, when once we pocket the difference between no-drainage and drainage, if we may be allowed the expression, then we shall know the amount of our present loss and of our future gain; and, besides the *£. s. d.* view of the picture, the more cheerful appearance of the landscape will bear a comparison at least with the present. Just now it has been shown that neither the inhabitants nor the cattle enjoy that degree of health which they will obviously do under a proper state of drainage and aeration of the soil; and, with the exception of a few aquatic plants, as the willow and some grasses, the present unhealthy state of the vegetable kingdom will also be changed to the better. In both cases the difference will thus manifestly be greatly in favour of the future—an ugly abnormal state of organism giving place to beautiful symmetry, both in the animal and vegetable kingdom.

The soundness of these conclusions is amply borne out by many examples where the drainage of low-lying districts has already been effected. There is not in the kingdom, perhaps, a single county which cannot show its example of great improvements having been effected in the health of man and beast, and also of the different crops produced by drainage, harvest being greatly more abundant, and in some places nearly a month earlier. In every case, the change that has taken place is so much in favour of drainage as to render detailed argument in its support superfluous.

The rationale of these changes, already alluded to in part, although not yet ascertained in all its chemical details, is, nevertheless, sufficiently known to entitle it to the appellation of a practical demonstration. Thus, in the case of undrained land full of vegetable matter, the decomposition that takes place in an excess of water gives rise to the "Will-o'-the-Wisp" or "Jack-o'-Lantern," that yet haunts so many of our valleys (phosphuretted hydrogen), and also to sulphuretted hydrogen gas—one of the most poisonous of all the gases; for air containing only 1-1500th of its volume of it was found to kill a small bird instantaneously, 1-800th to kill a dog and 1-150th a horse. Now, in these two gases we have to draw attention to the conversion of some of the most valuable fertilizing elements of manure, viz., the phosphorus, the sulphur, and the hydrogen, into pestilential malarial no less deadly to ourselves than to our cattle and cultivated crops. Whereas, on the other hand, in the case of properly drained and aerated land, the oxygen consumed in the process of decomposing vegetable matter is obtained partly from the atmosphere contained in the pores of the soil, and partly from the moisture it also contains, so that the nitrogen of the former and hydrogen of the latter are liberated along with the sulphur and the phosphorus in a nascent state, in which process one of the richest ammoniacal manures is formed, thus accounting for the great fertility of such soils, not unfrequently reported by practical writers to be "inexhaustible," the weight of crop and amount of cropping exceeding that of the best artificially-manured land. Hydrogen and nitrogen thus liberated have long been known, by various processes in the laboratory, to unite—forming ammonia. Henry, in his "Elements of Chemistry," gives an account of no fewer than three such pro-

cesses. The Society of Arts has offered a premium "for the production of ammonia or nitric acid from their elements, by methods which would admit of practical application;" and in its *Journal* of May 20th, 1859, will be found a paper by Alexander Williams, Esq., of Neath, "on a new method of manufacturing ammonia," which corroborates the natural process to which we have above directed the reader's attention.

The productive value of low-lying land when undrained, it will thus be seen, is very different from the productive value of the same land after it has been thoroughly drained and aerated, or broken up so as to admit of the free circulation of the atmosphere to the roots of the growing plants, and to decomposing vegetable matter. Many appear disappointed at the effects produced by the drainage of low-lying meadows and grazing lands, and hastily conclude that the present system is better for the farmer. But premature conclusions of this kind are deduced from mismanagement; the newly drained grounds in question not having been aerated so as to supply its quota of oxygen and nitrogen in the above process of manufacturing ammonia in Nature's laboratory, *the soil*. Imperfect as are the details we have given above of this natural process, enough it is hoped has been said to show the reader the important part the nitrogen of the atmosphere, or rather the air itself, plays in its successful completion; for without a suitable supply of air, sulphuretted hydrogen and phosphuretted hydrogen would be produced as at present, so long as the land contained moisture; and afterward, during the drought of summer, moulding and eremacausis would be the results. Under such circumstances the case is certainly worse for the farmer than at present. We have had occasion to examine professionally numerous examples of this kind, where the tenant

had less hay and pasturage after drainage than previously. But this is no argument for the contrary practice of drowning land, for the grasses that generally grow on wet meadows are not those adapted for them when newly drained, so that a two-fold change has to be produced before profitable results are obtained; for, in the first place, the generality of newly drained meadows require to be aerated, and in the second place to be stocked with herbage suitable for the improvement. Sometimes the opposite extreme is experienced, newly drained meadows being open and spongy from an excess of undecomposed vegetable matter, in which case the application of clay, sand, lime, bones, &c., is had recourse to, and not unfrequently pearing and burning. But details of this kind are foreign to our present subject.

The conclusion at which we have arrived is thus a very brief one: fresh air is no less a blessing to the plants that grow in our fields and to the manorial resources of the land than to ourselves and our cattle. But we deny our great river valleys this blessing, *pure air*, by keeping the soil full of stagnant water, thereby converting their productive resources of health and wealth into their contraries—pestilence, bad health, and poverty. The loss is inestimable to the whole population that inhabit these undrained districts. The small advantage to be derived from mills, canals, &c., is like a drop in the bucket when compared with it, and is no longer adequate to preserve the balance of public rights in a state of equilibrium. In short, mill rights and canal rights in our great valleys have long outlived their day and generation, virtually now ranking with things obsolete, while the grievances of those who have so long suffered from imperfect river-drainage demand immediate redress.

## HOW TO TREAT GRASS LANDS.

Mr. OLIVER, of Penhallow, read the following paper at one of the meetings of the St. Austell Farmers' Club:—Should a farmer nowadays complain of the low price of grain—which he is certainly justified in doing—he is likely to meet with this sharp retort from consumers, "Why don't you lay your land down to grass, that we might have shamble meat cheaper? Surely the price of beef and mutton is high enough!" thinking, no doubt, in their ignorance of agriculture, that by increasing the breadth of grass land we should increase the quantity of stock; but, as practical agriculturists, you are fully aware that the arable land of this country will carry a much larger amount of stock, when properly cultivated, than when laid down to permanent pasture. If, therefore, in a national point of view, cereal crops will pay the expense of cultivating, such land should not be laid down permanently to grass; for by so doing there would be a diminution of both labour and produce. Moreover, should these suggestions be adopted, consumers in this country would find themselves rather awkwardly situated in winter, when foreign stock cannot reach our shores, if winter fattening were discontinued, as it must necessarily be, on grazing farms.

1. In treating on the subject of grass land, I do not intend to confine my observations to permanent pasture, but to grass land generally, and will commence with seeding.

Previous to seeding, the land should be carefully freed from weeds; and in order to accomplish that object, as well as to prepare a compact and suitable seed-bed, the surface should be well pulverised. In selecting seed, particular attention should be paid to the kinds of grass found to flourish, and such as are readily eaten by stock on adjacent land of similar quality; for it is surprising what effect soil and climate have on vegetation. Grasses which are eaten by cattle with avidity on certain soils will be rejected when grown on soils of a different character; hence the necessity of studying nature in the selection of seed. Seedsmen, however, frequently proffer a mixture regardless of the character of both soil and climate, which to me "savours strongly of the shop." I have seen many fields, that have been injudiciously seeded down for permanent pasture with those mixtures, rendered almost valueless for many years, although heavily manured, by the coarse, inferior grasses domineering over the finer sorts, so that it has been found necessary to rip them again at a considerable sacrifice. Old grass land, in the

light soils and humid climate of Cornwall, is generally found to abound in soft grasses, chiefly of inferior quality, ill-adapted to the fattening of either cattle or sheep, especially woolly, *grass* (*Holcus lanatus*), which is of little value. It is, therefore, necessary to introduce some of the hardier kind of grass, such as the foxtail, catstail, or timothy grass, which appear to be well adapted to our loam soils; cocksfoot, a grass calculated to keep the digestive organs in order; rough-stalked meadow grass, &c. These grasses should, however, be but sparingly used with Italian and common rye, mixed with different kinds of clover (especially Cornish mail, which will remain much longer in the land than any other variety), so that, when the short-lived sorts die off, those which I have named, with others indigenous to the soil, may fill up the vacancy. The quantity of seed recommended by seedsmen is, I am persuaded, much too great. Grass crops suffer from being planted over-thick in the same proportion as grain or root crops. Much care is required in sowing grass-seeds. It should be done by broadcast machines; and even then, to ensure its being evenly sown—which is a matter of great importance—the land should be twice sown, by taking half the machine's breadth only at a turn. Rich soils, intended for permanent pasture, should be sown about the end of July without a corn crop. Good arable land should be sown about the middle of May with a corn crop, or earlier, if with wheat, and the crop be forward. Light, plain land, which should be but seldom tilled, is most profitably seeded down about the middle of July, without a corn crop, adding two quarts of rapeseed per acre, which affords much keep in the autumn or following spring. I would observe, by the way, that, when coarse upland pasture require to be "renewed," and are broken up for that purpose, the natural or indigenous grasses should by no means be destroyed, since grasses of a superior order cannot long exist on elevated poor land; and while it is impossible to purchase the seed of many of the native grasses, it is more economical to propagate from plants.

2. The manuring of grass land is a very interesting question; its effects are really wonderful. "Muck" is said to be the mother of manure; we will therefore first consider its varied effects, which will, of course, in great measure depend on its preparation, composition, and application.

This brief paper will not admit of my dilating on the re-

former questions; but, with regard to the latter, I would observe that, in order to improve a coarse, old pasture, dung should be well fermented, or, still better, decomposed, by being previously mixed with rich calcareous or aluminous soil, and applied in the autumn, the grass being first eaten close. Should it, however, be desirable to increase the quantity, recently made and slightly fermented manure should be supplied in the spring. On rich arable land I consider that farmyard manure is most profitably applied on the second year's grass, slightly fermented, in the spring; but on plain arable land I think it would be more advantageously applied in a similar manner to the first year's grass. As a rule, I am decidedly of opinion that farmyard manure is most profitably applied to grass land, taking into consideration the facilities afforded for its application, in the autumn and spring, when teams would frequently be unemployed—economy of labour being a matter of great importance. Many persons are of opinion that when dung is applied to the surface of land much of its manuring properties escape into the atmosphere. Experience and observation have, however, long taught me to think otherwise; and Professor Voelcker has lately, by a series of experiments, distinctly proved that it is benefited by exposure. Some years since I manured a field in February with recently-made yard manure. We had a continuance of cold, dry wind for about two months after. During that time the manure was frequently brush-harrowed, so that it had the appearance of short, dry straw; nevertheless, its effect was manifest long before any rain fell, and afterwards it was extraordinary—so much so, that I feel confident that I never applied manure to greater advantage. Lime is, no doubt, a valuable rectifier of rich old grass lands, by acting upon and decomposing inert vegetable matter, and neutralising acidity; but I consider it to be much more valuable when mixed with salt, having seen some wonderful effects from the application of that compound, to which sand is a great acquisition. I mix equal quantities of fish salt and quicklime, and then cover the heap with half the quantity of sea-sand, which prevents evaporation, fermentation being very great for many days; but when it has subsided I mix the whole well together, and subsequently apply it to the land by means of a manure distributor with great effect. If land be mossy, it should be well harrowed with a close, short-tined harrow previous to spreading the manure, and subsequently be chain-harrowed and rolled. Peruvian guano and nitrate of soda are both very stimulating manures for grass land; but, since they have a tendency to promote the growth of coarse grass, old pastures so manured in the spring should be eaten close with stock up to the middle of June, in order that the finer grasses may have an opportunity of taking their place, or the pasture is sure to become coarse, when the manure is frequently blamed instead of the management. Grass produced by these manures is readily eaten by both cattle and sheep. Bone, however, I consider to be generally the best manure for grass land in Cornwall, our humid climate being rather calculated to produce quantity than quality; and since a large amount of dairy produce and young stock is annually exported, requiring for its production a large quantity of bone-earth, that constituent must necessarily be employed to keep up the fertility of the soil; for, although there may not be a very perceptible falling off in the quantity of grass, the quality frequently becomes inferior from want of phosphate of lime, which, no doubt, is also essential to the health of stock. There are many instances in this county where the judicious application of bone manure has caused old grass land to carry double the quantity of stock that it formerly did, and that, too, of very superior quality. Previous to application, bones should, if convenient, be slightly decomposed either by fermentation or by mixing with the heap a quantity of liquid manure, the mass being well covered for a time by ashes or mould, which, when fermentation has ceased, should be carefully mixed, or sulphuric acid may also be used for the purpose; or it may advantageously be mixed, some months previous to being spread on the land, with way-soil or the cleaning of ditches. Bone manure should be applied early in spring, old grass land being well harrowed before and after. Such land should subsequently be cut for hay, since the bone will for a time interfere with the feeding of stock; and long grass has a tendency to rot and bury the undecomposed pieces of bone. Adulteration, no doubt, a great check to the application of artificial manure generally, which in many cases is difficult to detect save by the deficiency of our crops. The safest plan, therefore, is

to patronise respectable manufacturers, and not suffer ourselves to be gulled by vendors offering cheap goods, which are not unfrequently nasty.

3. The stocking or cutting of grass land requires some consideration, which will, of course, depend greatly on its character.

I consider, however, that under all circumstances it is unwise to eat young seed plants with sheep until they have taken a firm hold on the land, since sheep are apt, by biting close, to pull up a considerable number and injure others. Young cattle are, therefore, preferable to take the first cropping, since, while fastening the land, they do not bite close. Grass intended for permanent pasture should not be cut the first year, but be stocked close, in order that the finer grasses may have an opportunity of taking their place, which are frequently smothered when the crop is cut. Old pasture land should be occasionally mown, but in all cases early; otherwise rank grasses are sure to predominate over the finer varieties, and the sward consequently becomes coarse. On shallow, quick, arable land, the first year's seeds should be cut. If eaten, the land, being exposed to the scorching sun, frequently produces but a light crop of grass, while, if shaded, it would have produced a heavy crop of hay.

4. The mechanical condition of grass land is a subject worthy of notice, since it has great effect on the character of its produce—light land being congenial to the growth of bent and inferior grasses generally, while firm land is favourable to the leguminous grasses, and those containing the largest amount of nutriment.

I therefore consider it prudent to stock our dry old pastures heavily with mixed stock during the winter, and find that the part which gets the greatest amount of treading invariably produces the best quality of grass the following summer. My old pastures at Trescowe are frequently infested with the grub of the cockchafer and other worms, which render portions of the land very light, thereby exposing themselves to the prey of rooks, and at times apparently destroy all the grass of a considerable breadth of land; but for many years past, on discovering the location of the grub—which is perceptible from the dry, coarse nature of the grass—when the land is very wet in winter, I have roots carted on it, and there consumed by cattle, treading the land very firm, which entirely destroys the baneful effects of the insect, and causes the land to produce grass of superior quality for many years. Grass land is frequently rendered too light through the instrumentality of earthworms, by driving into the subsoil and depositing the fine mould on the surface—a valuable process, if kept within bounds, but, like miners generally, they are apt to do great injury by cutting off a sufficient supply of water. They must, therefore, either be destroyed or their effects counteracted by some mechanical means. The mole is, no doubt, very useful in destroying grub and various kinds of worm which injure our cultivated crops. Moles will occupy land no longer than they find food. I have seen many crops of both grain and roots saved through their instrumentality, but am not aware that I ever saw one injured by them. The chain-harrow is an excellent implement for spreading the earth deposited by them on the surface. Nature's little drainers, the earthworm and the mole, bring to mind the necessity of draining wet land previous to laying it down to grass. Stagnant water not only prevents the growth of superior grasses, but promotes the growth of those of an opposite character. All wet low land should therefore be drained and trench-ploughed previous to being laid down to permanent pasture.

5. In conclusion, I would observe that I consider it desirable, with the existing price of agricultural produce and labour, to increase the breadth of grass land in Cornwall in the following manner:—

1st, By allowing arable land to remain four or five years out to grass, instead of breaking it up at the end of two or three years, as is now commonly done. By adopting that plan much better crops would be grown than at present, and there would be less complaint of clover-sick land, rotten roots, and light grain; while the expense of cultivation would be considerably diminished. Much land in Cornwall would produce good pasture for four or five years, that is not sufficiently strong to lay down permanently to advantage. 2nd, A considerable quantity of our elevated thin soils, kept under the plough, certainly cannot be properly cultivated with the present price of grain. Such land should be boned, laid down



to grass, and not tilled, save with the view of renewing the pasture; and that should not be hastily done, since the decay of certain grasses frequently makes room for those of a superior order. 3rd, Much of our deepest, best arable land might undoubtedly be laid down to permanent pasture with advantage; but, since laying down land for permanent pasture is an expensive process, and is a permanent improvement to the farm, enhancing its rental value, I consider that it is only fair

and reasonable that landlords should assist their tenants in accomplishing this desirable object, by supplying the necessary quantity of bone manure, the tenant paying, say, 5 per cent. on the outlay. If that system were adopted, the value of an immense quantity of land in this county might be doubled; whilst landlords, their tenantry, and the community at large would be greatly benefited. Permanent improvements are certainly the duty of landlords, and not of tenant farmers.

## RAILWAY AND STEAMBOAT CONVEYANCE OF CARCASSES.

Although the conveyance of animal food from the provinces where it is produced, to our large manufacturing and commercial towns, where it is chiefly consumed, undeteriorated in quality or upon improved plans from those now in operation, has become a national question of the first magnitude, it unfortunately cannot be said that those engaged in the trade—such as railway companies and steamboat companies, farmers' carcass salesmen, &c.—have yet taken this view of it, practically speaking. Indeed, taking the British capital as an illustration, it can hardly be pronounced an exaggeration to say the trade is about as barbarous as can well be imagined in all its multitudinous ramifications. And this, too, is not even the most objectionable feature of the practice now in force; for when prospectively viewed it appears as if it were determined to move in the opposite direction of improvement, as the present mode of conveyance is daily growing worse and worse with the rapidly-growing increase of supplies. Our readers may well say, "This is not a very flattering exordium to any class engaged in the carcass trade, home or foreign;" but the time has obviously arrived when the plain facts of the case must be allowed to speak for themselves, in order to awaken the ear of the public to a national sense of duty; for an abundant supply of wholesome animal food for the Metropolis and our other large towns has already become the leading question in the political economy of the country. Not a few of John Bull's somewhat petted and pampered children are even becoming alarmed lest the growing prevalence of disease amongst our domestic animals should so interfere with supplies as not only to reduce their own daily allowance, but also permanently to enhance the price of labour now being demanded by the working-classes, so as to enable them to obtain what they require. What between cattle plague and high-priced meat on the one hand, and strikes for higher wages on the other, a large portion of the English public is so panic-stricken as almost to be afraid to face the future.

Grumbling is proverbially the native privilege of every free-born subject of the realm. There cannot be a question raised about this to the contrary. But grumbling after things go beyond a certain limit becomes very un-English, and this too aver is the true character of the groundless fears and apprehensions now being raised relative to the approaching scarcity of wholesome animal food; for in this case, as in all others of a similar character, Necessity will be found to be the mother of Invention; for if any ingenious inventor would only come forward and produce a method of conveying carcasses by railway and steamboats free from the injury at present sustained, the discovery would hush into silence the hurricane of alarm that is now sweeping everything before its ruin-spreading course. So long as English farmers and dairymen and Continental farmers and live-stock dealers continue to congregate cattle together in increasing numbers at embarking and disembarking ports, and in fat-stock markets and town dairies, what can be expected but an increase of contagious diseases of a typhoid character? The contrary experience would fall nothing short of a miracle! But supersede this antiquated and highly objectionable plan of live-stock marketing, by improvements in the conveyance of carcasses, as suggested above, and by a more natural and wholesome dietary for fat stock and milch cows, so as to enhance the quality of their flesh and milk, and the contagious diseases that are at the present time decimating herds and flocks (thereby lessening the future supplies of animal food to an enormous extent) would soon disappear; supplies would at the same time be greatly increased both in quantity and quality; consequently the profits to all parties now engaged in the commerce of animal food would be

greater than what they are at present even in the absence of disease; while the advantages to the consumer would be still more satisfactory. Such being the manifest conclusion, the practical course which farmers and the public ought to adopt is self-evident, viz., private sales or markets for breeding lean stock and milch cows, greatly improved dead-meat markets at all our large towns, and a proper method of conveying carcasses to market by railway and steamboats.

In confirmation of the soundness of the above conclusion from a practical point of view, we have first to observe that of late private sales by auction or otherwise have been greatly on the increase amongst the agricultural body, almost all our improved breeds of cattle being thus sold at home where they are bred, and the intelligent observer of the progress of science in this branch of farm practice—one which is rapidly growing in importance—cannot fail to perceive that public markets are not the places that are suited for the exchange of our improved breeds, and that eventually Donnybrook and all the old uproarious public markets, with their rags, filth, and dirt, must give place to private sales. Our Metropolitan Cattle Market, for example, when seen in the light of progress, truly belongs to an age long gone by. The carcass trade, again, is anything but what it should be; nevertheless, as a branch of commerce, it is annually increasing, and fast superseding the live-stock trade, as has already been shown. And if such is the result under an antiquated method of conveying carcasses, and even deplorable state of things generally, what would the result be under all the improvements contemplated in the different departments of the carcass trade?

Improved carcass-vans for common road and railway conveyance of dead meat, and improved steam-boats built for the express purpose of conveying all sorts of fresh animal-food from the continent of Europe and other places, together with improved slaughter-houses, setting-houses, and dead-meat markets, is no new proposition. With regard to the British capital, the subject is as old as that of the removal of Smithfield Cattle Market and the improvement of Newgate and Leadenhall Dead-meat Markets; and about the time of the Exhibition, 1861, in Hyde Park, we were told, by no mean authority, that so long as the Corporation of the city of London had the control of the markets the desired improvements contemplated were beside the question! The out-of-date character of the Live-stock Market, since then opened, and the no less antiquated character of the Dead-meat Market, now in progress of erection, certainly afford tangible proof of the soundness of the conclusion; and, further, the proposition of a CATTLE PLAGUE HOSPITAL is in perfect harmony with the above antiquated anomalies. The commerce of a suitable supply of animal food (including milk) for the British capital is a national proposition that has greatly overgrown the capabilities of the old Corporation of London to govern. A new tribunal is therefore absolutely necessary, in which the producer or agricultural interest should be better represented—a tribunal which would give more encouragement to private enterprise than a huge jobbing monopoly under "the cat's paw" of few cattle-market hawkers, both of whose interests are, in a great measure, diametrically opposed to the carcass conveyance improvements in question by railways and steamboats.

The subject requires to be thoroughly canvassed *de novo* in the provinces and in the columns of the agricultural Press. Farmers are very much to blame for their supineness of action in the matter, for were they to make themselves practically familiar with their present losses, and to let the engineering world know what they want, and their readiness to support

progress, the improved carcass-vans and steam-boats for conveying carcasses free from injury would soon be invented and placed in active operation, the former on every railway in the kingdom, and the latter between all the embarking and disembarking ports—from which and to which cattle are now conveyed—under the cold-blast-chilling, sweating, fasting, and inoculating processes. Whatever city corporations, cattle-market-bankers, with their salesmen and butchers at the other end, may say to the contrary, these are not the processes which animal food requires to undergo either for the interest of the producers or consumers.

At present, dead meat also undergoes two of these processes, viz., sweating and inoculating. We repeat, it requires no second sight to perceive that neither the purse of the farmer nor the stomach of the consumer requires chemical processes of this kind to qualify animal food (dead or live) for the English market. Moreover, the concentration of all sorts of carcasses into one large market—a market that is annually increasing in its demands—is just as objectionable in a sanitary point of view as the concentration of all sorts of cattle into one live-stock market, and the concentration of sickly dairy cows into large hospitals for the cure of typhoid disease. Surely we may take it for granted that the agricultural body generally are further advanced in chemistry and physiology than the sweating and other processes of the metropolitan live stock and dead meat markets imply. At all events, it is high time that they were so; for both these departments of the commerce of animal food is in a very unsatisfactory state at the present time, reflecting the highest degree of discredit to all concerned, more especially the agricultural body, who are evidently “selling their kens in a rainy day.”

Improved carcass-vans for common roads and railways, and carcass steamboats being the work of future discovery, nothing can be said about their construction at present. There are, however, certain principles that must be attended to in their construction, and also in the methods of conveying carcasses, which may profitably be discussed, together with the many shortcomings of the present system, both by sea and land; and farther, as numerous objections will, no doubt, be raised to the proposed carcass trade by those interested in the live-stock trade, more especially at the present time, when contagious diseases prevail, these also may be profitably disposed of in a single paragraph.

*First:* Different qualities of meat must be conveyed separately, and provision should be made for such in the construction of carcass-vans and steamboats for the conveyance of dead meat. In other words, there is a large proportion of animals in a less or more abnormal state of health, whose carcasses, when slaughtered, are liable to undergo certain chemical changes, equally different from each other; others to produce fungi; others protozoa; and these, if brought into close contact with the carcasses of sound, healthy animals, inoculate them, thereby producing the same chemical change or crop of fungi, &c. Obesity, for example, is a disease, and the carcasses of obese animals will inoculate the best meat, thereby reducing the two to a common equality. Without, therefore, going further into detail under this head, we at once come to the practical conclusion that difference of quality must be scrupulously attended to in the conveyance of dead meat of every kind, both by sea and land, for our metropolitan and other markets.

*Second:* Carcasses must be protected from the extremes of temperature—from the extra heat of summer as well as from the frost of winter.

*Third:* Carcass vans and steamboats must be thoroughly ventilated by artificial means, vitiated air being removed, and pure air supplied; and in effecting this the small penetrating dust of railways, and the moist and often polluted air of steamboats, must be excluded by charcoal filtration or other processes.

*Fourth:* In times when contagious diseases prevail amongst live stock, such as the steppé murrain at present, it may often be advisable to fumigate carcasses, and even to convey them in a disinfected atmosphere, although they have been entirely free from disease when first hung up in the setting-house. According to the organization of the carcass trade proposed, unhealthy animals would be virtually wholly excluded from the dead-meat market; for farmers would be obliged to give up rearing and fattening such animals—an alternative which would be greatly to their advantage.

*Fifth:* The sides, quarters, or legs of carcasses ought not to be allowed to lie upon or even touch each other in the carcass van or in the steamboat, otherwise they will very soon generate disease; and the meat will suffer less harm if carried suspended in the position in which it was cooled and set than if allowed to lie upon trays or framing of any kind. Land-owners, farmers, butchers, and provision merchants are familiar with the propriety, and even necessity, of attending to this, especially during the warm weather of summer, or during moist warm weather at any season of the year; and therefore it is surprising that so little has been done by them to effect improvement in the present barbarous method of dead-meat conveyance.

*Sixth:* Dead meat of every kind, including butcher-meat, fish, fowl, and game, should be conveyed directly by through trains to market in the shortest possible time, and, so far as practicable, during night; and it should be conveyed in first, second, and third class carcass vans, according to quality, as previously proposed.

Now, without going into details, which our present limits will not permit, we see no great difficulty in the way of a successful practical solution to each of the six foregoing propositions, so that objections of every kind fall to the ground. Indeed the contrary conclusion would obviously be throwing a reflection upon railway and steamboat engineers which they do not merit. At the same time the facts of the case evidently indicate that their end of the yoke is rather behind than in advance of that of the opposite party, the farmer and butcher; for the present railway and steamboat systems are the very reverse of what the above propositions involve. It is high time, therefore, for railway and steamboat companies to make a move in advance; and we venture to say that if they do so in the right direction they will meet with the hearty co-operation of the agricultural party in every province of the kingdom. A FIRST PRIZE STOCK BREEDER.

## MICHAELMAS RENTS ON CORN AVERAGES.

SIR,—I again avail myself of the return of the close of the farmer's year to send you, for the information of your agricultural readers, and more especially those who may have adopted the system of corn rents, based on the average price of wheat, or of wheat, barley, and oats, a statement of the average prices, founded on the returns published weekly in the *London Gazette*.

For the year ending Michaelmas, 1865, the average prices are as follows:—

	s.	d.
Wheat ... ..	40	8½ per imp. qr.
Barley ... ..	29	1     "
Oats ... ..	21	4½     "

The highest and lowest prices during the same period are as follows:—

	Highest price.	Lowest price.	Difference.
	1865.	s. d.	s. d.
Wheat ...	Sept. 5 ... 40 7	{ Dec. 30, 1864 } 37 10 ... 8 9 { Jan. 6, 1865 }	
Barley ...	{ Sept. 5 } 31 2 { Sept. 12 }	{ June 20, 1865 } 27 8 ... 8 11 { July 18, 1865 }	
Oats .....	{ Aug. 1 } { Aug. 8 } 24 0 { Aug. 29 }	Jan. 6, 1865 18 10 ... 5 9	

I remain, Sir, your most obedient servant,  
CHARLES M. WILLIUGH, late Secretary and Actuary  
University Life Assurance Society.

2, Montpelier-square, Brompton, S.W., Nov. 6, 1865.

## THE PROGRESS OF STEAM IN THE FIELD.

The friend is not always judicious. He is apt to say a little too much, to vaunt the excellences of his friend a little too highly. Possibly this is due to a remote tendency to self-exaltation; but whether this is so or not, the result is sure and certain. Disappointment always follows, and reaction.

When steam first came to the aid of the farmer in the field, a great deal too much was said—a great deal too much was expected. It was to accomplish in no time a complete revolution in all our tillage operations. It was at once to antiquate all that was, to reduce the expenses of cultivation to zero, and to impart to our soil its maximum fertility. The friends of steam were a little too enthusiastic—too sanguine; they made a trifle too much of their lion; and the consequence was that the immature power was unmercifully quizzed and pulled to pieces. A reaction set in, in fact; and we have heard very little of steam for some time.

It has been, perhaps, well for steam to be thus allowed quietly to work. Some hundreds of sets of apparatus were in private hands before this reaction commenced, and these during a series of years have been silently tested.

The result, we are glad to find, is satisfactory. The very wide expectations formed have not been realized, as a matter of course; but those of a moderate character have been surpassed. A silent and gradual revolution has been going on under the eyes of those men who have had the sagacity and courage to induce it, and every man who has worked his tackle with consideration and judgment is found to rejoice in its possession. They can show a far better balance-sheet than their less enterprising compeers, who have merely depended upon horse labour, and have reason to thank the circumstances that led to the change.

It is astonishing how difficult it is to arrive at any definite conclusion respecting an agricultural experiment, mechanical or chemical, or both. For such experiments in a general way there exists in the year but a few weeks, and therefore, before any reliable result can be obtained from experiments that have to be made amid a series of ever-varying circumstances of soil, climate, &c., several years must elapse. And then, too, so few farmers pretend to any accuracy in book-keeping, that it is really seldom that a man is found competent to institute a comparison with respect to the old mode and the new. It is exceedingly rare to meet with a farmer who by reference to any account can give the history of any one of his fields for five years back, and tell his querist in any one of these years what was the expense of cultivation, of manuring, of harvesting, and what was the produce. And if this cannot be done, how can he possibly give any but the most general and unsatisfactory reply to any one who questions him as to the advantages of steam cultivation? If there be no means for arriving at this special information with respect to the profit and loss account of each plot or area under cultivation, how is it possible to say where the loss or where the gain has been made in the year's transactions? The gain attributed here, or the loss there, may be very falsely attributed; and the apparent benefits of steam cultivation might, if properly analyzed, prove to be actually no benefits at all, but the reverse. In order to ascertain these things men must go into details, and not longer be satisfied with totals. The vague manner in which the expenses of a farm are calculated afford, for instance, a fair specimen of the reckless system of account keeping that must prevail. At any

market, fair, or farmers' club, let the question of horse-keep be started, and it will be found that the estimates of this serious item of expenditure will prove as numerous as the persons asked. Each will give a different reply. There appears to be as yet no settled conviction on the subject. Most men will studiously avoid the subject altogether, with the remark, "Thank you, I would rather not know what my horses cost me; I know they eat up all the profit, but they are inevitable." So long as a want of fixity is observable in estimating the cost at which horse-power is maintained, there can be, of course, no certainty with respect to the calculation of processes in which horses furnish the motive power. In the same manner, but to a less extent comparatively (because it concerns a very superior class of men), the like uncertainty is found to prevail amongst men who are using steam-cultivating apparatus with regard to the statement of expenses. Very few of the persons who have used them have yet attempted to ascertain their cost; and, amongst those who have, fewer still have arrived at anything approaching to a satisfactory and fixed conclusion. The same might be affirmed of several other items of farm expenditure, which, had they been within the province of manufacturing proper, would long ago have been accurately measured and tabulated. So far as time is required for the necessary experiments, it cannot be avoided that years will elapse before reliable results can be announced; but so far as the announcement of such rules for guidance depends upon accurate accounts and accurate observations, there is nothing to delay the publication of such defined results, but the disinclination to obtain them.

Could the results of steam culture have been compared with those of horse culture for any length of time under the same invariable influences, like the testing of two machines in a room of constant temperature with material of uniform quality, we should long ago have known what we were about, and probably steam would have been far more generally used in farm tillage than it now is. The sanguine, who rarely wait for results, and the far-seeing who arrive at their judgments by a species of intuition, are mainly those who have had courage enough to become steam-plough men. The cautious are yet lingering. They pry over the hedge, and listen for reports. On this hand they are told of profit, on that of loss. So they oscillate between two opinions, and stick to their team till the light in one direction or another becomes clear. Of those subjects of which men know least, they generally speak most dogmatically. On what conclusions it rests we cannot see; but there seems to be in the public mind a very firm conviction that steam culture is best adapted for heavy land, and will be confined to it. Nothing is more clear than that the steam horse is a God-send to the clay-land farmer. It came to him just when

\* The following may be found in an early copy of the *Harl Lane Express*, dated Feb. 11th, 1837. A committee of the Harleston Farmers' Club report as follows:—"Your committee, in common with every member of the club, was astonished to find that amongst a body of farmers, all residing within four or five miles of the place of meeting, all using a similar breed of cart-horses, and cultivating a similar description of land, such a marked difference in the expense of maintaining their teams should exist, amounting in authenticated statements to upwards of 50 per cent., whether estimated at per head for each cart-horse, or per acre for the arable land."

he began to see that his only hope was in deep culture, for which in horses he held no efficient power. But although it may at once be granted that the heavy clay land of Great Britain could not be developed without steam, it by no means follows that steam cannot be profitably applied to light land. The most surprising success has attended the light-footed motions of the strong steam horse on heavy land: the under-drain, the digging breast, and the winter's tooth together have wrought wonders on such sticky, tenacious clays as are found in Somersetshire, Gloucestershire, and Essex; but, with less to do, they will prove quite as effective where the soil is light and easily worked with horses. It may be true that the apparatus adapted to heavy is not adapted to light land: but, with an allowable accommodation in this respect, the power which is so invaluable in one case is quite as invaluable in the other. There are but few instances in which this can be seen, simply because light-land farmers have generally persuaded themselves that steam could never be of any advantage to those who could plough as deep as they wished with two horses. To one of these few the attention of the reader will be directed. It is not necessary to mention the name, the locality, or the implement maker: suffice it to say that the land furnishing this instance is of the lightest description, and rests on a chalk substratum.

The farm in question, within half-an-hour's ride of London, consists of 600 acres of mixed land, but land mainly under the plough. Of this, 300 acres are under the seven-course shift—potatoes, wheat, oats or barley, green rye, peas or tares and crop after, barley, seeds, wheat; 130 acres are under the six-course system—potatoes, wheat, mangels, wheat, seeds, wheat; 90 acres, under the four-course, lie at some distance, and are worked for sheep. The soil, which varies in depth from six inches to six feet, is not drained, and under all circumstances can be ploughed with two horses. Having thus specified the sort of soil dealt with, and the course of cropping, it may in the second place be well to show what work is usually performed in preparing for each crop. To begin, then, with the breaking up of the wheat or stubble, in September, for roots: If weedy, the plot is scarified and harrowed; and when the rubbish has been well weathered, it is turned down with a ten-inch furrow without difficulty. Manure is also covered in without difficulty, in the same way. The land, in spring, is ridged with horses; the dung is applied; and the ridge is split, and left for the deposit of seed. For wheat after potatoes, only one scarifying is required; for oats, the land is skimmed before winter, and a six-inch furrow, with ten load of manure, is given before sowing; for green rye the land is scarified, dunged, and ploughed in September, and sown directly, so that it may be cleared from May to July following. As the rye is cut green, the land is dunged and ploughed (generally with horse-power) as it is cleared; and, so long as the season serves, the vacant place is filled up with cabbages, dibbed, and subsequently with turnips, rape, &c. If the cabbages are removed in March, the land is fitted for spring wheat with a single furrow, if in April for barley. For wheat after seeds one furrow suffices. All this work by reason of being done at the proper season, quickly done, thoroughly done, is now effected by means of a ten-horse-power engine and apparatus, and nine horses. Formerly, that is to say so late as 1859, twenty-two horses were employed in producing a result for inferior dimensions.

The apparatus was supplied in the year 1859. The first attack upon the land was a formidable one for the steam-plough, and we may also add for the land: The soil was matted together with weeds, and the pan was exceedingly unwilling to yield to the thrust of the share. In the

register, which has been most carefully kept by one who had no foregone conclusions to serve—by one who took to steam on purely economic grounds—the work done for the first and following years is thus summarised:

For the crop of 1861—

Land under tillage ... ..	400 acres.
Days at work ploughing and scarifying ...	70 days.

The number of days in this year would have been greater had not the wet autumn of 1860 interfered.

For the crop of 1862—

Land under tillage ... ..	510 acres.
Days at work ploughing and scarifying ...	115 days.
Ploughing on hire ... ..	45 days.

For the crop of 1863—

Land under tillage ... ..	510 acres.
Days at work ploughing ... ..	84
"    thrashing ... ..	21—105 days.

It may be remarked in passing that the whole crop was thrashed by the ploughing engine.

For the crop of 1864—

Land under tillage ... ..	510 acres.
Days at work ploughing ... ..	75
"    thrashing ... ..	26—101 days.

Here again the entire crop was thrashed, and it may be further remarked that for these two last crops the work done in acres amounts to 575 in each year.

For the crop of 1865—

Land under tillage ... ..	510 acres.
Days at work ploughing ... ..	54
"    thrashing ... ..	29—83 days.

It is observable that the days occupied in thrashing increase, indicating a larger bulk grown; while the days occupied in ploughing and scarifying decrease, indicating increased facility in working, increased freedom from weeds, increased fertility, and pulverization; the soil, in fact, needing less culture. During the whole of this period the crops were visibly increasing, and at no time did the number of horses exceed nine.

The actual accounts received for the whole period being produced, together with vouchers for the entire expenses, it is simple work to reduce them to a table of *annual cost*, remarking by-the-by that the "account" includes the supply of several improvements made in the apparatus after the year 1859.

	£	s.	d.
Account ... ..	60	0	0
1 year's coal... ..	72	0	0
Oil ... ..	8	10	0
Depreciation and interest ... ..	100	0	0
	£240	10	0

The account against the nine horses is as follows—

	£	s.	d.
Cost for nine horses... ..	183	0	9
Hay ... ..	108	0	0
12 acres of green meat ... ..	84	0	0
Depreciation and interest on nine horses, valued at £40 each ... ..	45	0	0

£420 0 9

Thus we see that the thrashing, cartage, and tillage on this farm of 600 acres is done, so far as horse-power and steam are concerned, at an expense of £660.

Many men may be unprepared for such a case against horses on a light land farm, but such we are assured are the actual figures. It may be objected that no allowance is made for manure in the statement; but let it be remembered that the account, on the other hand, is not charged with the straw, the repair and depreciation of implements, and harness used with the horses. Here, then, without attempting to balance the two cases with

exactness, is a power called in to displace and replace thirteen horses.

	£	s.	d.
The annual cost of the power substituted was	606	13	4
The annual cost of the substitute is	...	240	10 0

The apparent gain ... .. 866 3 4

There are three considerations which go largely to increase the sum which, after the above process of subtraction, is left as gain.

Threshing, when horse-power only was employed, and maintained at a cost of £1,036, was an extra; now that steam has displaced a considerable proportion of the horse power, and reduced the expenditure of certain specified operations to £660, threshing is included.

The seasonableness and thoroughness of the tillage operations render altogether unnecessary the multiplied acts which used to characterise every system of good husbandry. One deep steam stirring at the right season is made to take the place of several alighter ones. Every year the work becomes easier, more manageable, and the days spent in tillage operations fewer.

Although no account has been kept upon this farm to measure the exact result of steam as against horse power in actual bulk of produce—and such an account for the reason that horse power and steam are used in conjunction is impossible—the owner of the farm is perfectly satisfied. His stackyard and his banking balance show a state of improvement that can only be attributed to the employment of steam.

F. R. S.

## MY POTATO CROP.

BY A PRACTICAL FARMER.

Having to plant a rather large breadth of potatoes in the past spring, I resolved to take more especial notice of the growth of one particular crop, chiefly with the view of satisfying myself as to the comparative value of the different manures applied, and the various little deviations of management I had adopted. The field contains about nine acres; the soil an alluvial loam, upon a silty (old sea sand) subsoil. The preceding crop was wheat—a rather heavy one. Adjoining the field is a large public pond. This pond had not been cleaned out for the space of forty years; consequently the accumulations of one kind of matter or another was very considerable, and formed a deep stratum of what is denominated “pond mud.” With more courage than discretion, as I often thought whilst doing it, I undertook to lead out this mud, and to spread it over the surface of this field, which I did, at the rate of about forty loads the acre, except a portion on the east side, which was left uncovered. This was done immediately after harvest, and was laid upon the wheat stubbles, the wheat crop having been mown. During the winter I collected a large quantity of ditch roadings and the rich earth-mud from the cleansing out of a public drain. These I mixed slightly with foldyard dung and pond mud in a dung-heap, and in February turned all over, throwing over the turnings, as we proceeded, a good dressing of lime and salt mixed. This proved to be a valuable compost. I also purchased a quantity of Lawes’ super-phosphate, Peruvian guano, blood manure, and a popular manure from the west of England. The potatoes, imported from Scotland, were of the very best stocks; some from Renfrewshire, and the remaining from near Dunbar—all provincially here called Dunbar Regents. Those from Renfrewshire were as they were grown, except the chate. The Dunbar lot were good seed.

The ware having been taken away, the field was deeply ploughed in the early winter; in the early spring it was cultivated, and slightly but sufficiently worked by harrowing, &c., &c.; but owing to the unusually fine winter it was speedily in good order, having a fine deep mould, and being in the very best state which we like for ridging. We commenced ridging and planting in the early part of April, the ridges being 82 inches apart. On the east side of the field, where there was no pond mud, 28 rows were manured with twelve loads of very good fresh dung direct from the fold-yard, 8 cwt. of the lime and salt compost, and 8½ cwt. of Lawes’ superphosphate, per acre. The two latter dressings were sown by

hand along the open ridges, the potatoes (Scotch Regents) planted upon them at about 14 inches from set to set, and then the ridge was closed. (This was the course pursued throughout the field). Next to these 28 rows we commenced manuring with the like quantity of good old and well-fermented fold-yard dung; this manuring was continued throughout the field. The 92 rows next to these 28 rows had the same dressing of compost and superphosphate per acre, and pond mud. Next to these 92 rows were 16 rows having a dressing of 8½ cwt. of Peruvian guano (Lawes’s selection), and in the remainder of the 44 rows of Regents the dressing of 8½ cwt. was the west of England manure, all having the dressing of pond mud, and the like management.

My first noted observations were on the 12th of May. The 28 rows had not put in an appearance; the 92 rows exhibited the potato plant from end to end, and growing fast; the 16 rows (guanoed) only just coming up; the 44 rows, rather forwarder, but not equal to the 92 rows, the whole planting only occupying three days. On the west side of the field was an acre of Rock potatoes, but all manured alike. These at this date were not to be seen, and were last to come up. In a few days, the twenty-three rows slowly and gradually came up, as did also the Rocks; but they continued in the same relative positions throughout the summer, except the “guanoed” part—i.e., the sixteen-rows. These grew the slowest till the middle of July: they then began to show decided strength, owing, I thought, to more moisture from rains and dews; and ultimately they headed the field in haulm. Up to this time, the superphosphate ninety-two rows had a decided lead, being more luxuriant. The whole crop was thrice horse-hoed and twice moulded up. It progressed most satisfactorily throughout, and appeared the most promising crop in the neighbourhood. Its general appearance was so full and fine as to call forth the commendations of every passer-by. On the 6th of August, symptoms of “the potato disease” began to manifest itself. The copious rains in the early part of harvest caused it to spread fast. The field adjoins one occupied by a small farmer, whose custom it has been for years to cut off the tops on the first appearance of the disease, and with very good results. I resolved to try the like course with some rows at several and separate distances. These had the tops—i.e., the haulm—cut off in their greenest state. The adjoining rows left untouched. In other places I had rows, cleared of the haulm, in a partially diseased state, and others when far advanced.

On September 30th we commenced harvesting the crop. I examined three rows adjoining each other, which had the haulm taken off when first attacked and green, the adjoining three rows which were left untouched, and other rows which were cut off when far advanced. I took up the potatoes at separate distances, along the rows, of twenty paces each, and counted them. The first on the three rows cut green averaged 231 good or sound tubers, and 126 diseased ditto. The uncut averaged, in the like distance, 165 good or sound tubers, and 199 diseased ditto. The rows cut when partially diseased averaged, in spaces as above, 211 good or sound tubers, and 171 diseased ditto. In another part of the field the haulm of one row was cut off in its greenest state: the adjoining rows left uncut. In the single row, also cut green, the twenty-pace intervals averaged 295 sound tubers, and 194 unsound. The uncut rows adjoining, in the like spaces, averaged 227 sound tubers and 196 unsound ones.

This little experiment may not be decidedly conclusive to many of my readers; but to myself, who watched it throughout, it was truly so. I have no hesitation in asserting that if our crops were immediately denuded of the haulm upon the first appearance of the disease much good would result, and their safety would be further aided by remoulding up. In accounting for the less number of tubers in the uncut or totally decayed rows, I would say that many were found quite rotten. It may be observed that the disease was very bad throughout the field, averaging, according to experiments as above, 227 sound to 196 unsound—a sorry average of bad ones. The sound and unsound would together have made a good crop, perhaps averaging twelve tons per acre; as it is, I could observe that the mild or looser loam of the field yielded a larger proportion of sound tubers than the stiffer or close loamy parts, and the richer the soil and dressing the greater the loss. It is well worthy of remark, too, that the tubers in the early cut rows were fully equal, if not larger in size, than the uncut rows. Certainly the disease spread very rapidly. There was not much time to cause any great difference, but that difference is in favour of the early topping. On the west side of the field, planted with Rock potatoes, scarcely any unsound tubers

were found, and the crop very good. Does not this indicate that the better the quality of tubers the greater is the liability to disease? I know this is so in a turnip crop in severe frosts; still it is by no means a certain indication. Fluke potatoes, for instance, possess most superior quality, and yet in this season scarcely any tubers are diseased. Rocks and Flukes are this season the freest of all kinds from the "disease," and both are yielding good crops.

In another field of ten acres, all Rocks, I adopted the like management, except that I used "Blood" manure in preference to the "West of England" manure; but I found that, good as its quality was, it did not equal Lawes' Superphosphate or guano. The superphosphate dressing forced the potatoes first into growth; the West of England manure second; guano third; and the blood manure last; and others of my experiment about an average.

On July 2nd I examined my experimental rows; i. e., 16 rows, ten loads old muck, 8½ cwt. super-phosphate, and 8 cwt. compost throughout—good average. Six rows, no manure, but like artificials as the 16 rows—defective. Thirty-three rows, 10 loads old muck, and same artificials—a good average. Fifty-six rows, 10 loads fresh dung and the same artificials—not equal to the above. Twenty-five rows, 10 loads of fresh dung, and same weight of West of England manure—not an average. Thirty-nine rows, 10 loads ditto, and 8½ cwt. guano—second-best in the field. Twelve rows, 10 loads as before West of England (best), 12 ditto as before, and home compost—average. Twelve rows, 10 loads as before of blood manure—about an average. The remainder of the field blood manure, &c.

August 2nd, again examined the field, and estimated the progress of the various rows: The 16 rows better than the 6 rows; the 33 rows better than the 6 rows, and equal to the 16 rows; the 56 rows better still than either; the 25 rows not equal to the 56 rows; the 34 rows best in the field; the 12 rows second-best; the next 12 rows not so good; and the remainder of the field, all blood-manure dressing as above, about an average.

In harvesting the crop we found that each of the above estimates was fairly borne out. The crop was a good average one, of superior quality, and nearly free from disease.

## CHEMISTRY OF BRICKMAKING.

Brick and tile manufacture embraces two processes—the one chemical and the other mechanical. In a former paper we offered a few desultory observations on the latter, and in this we purpose investigating some of the more important details of the former, confining our enquiry chiefly to the quality of the clay, and the chemical processes involved during kneading, moulding, drying, and burning. The object of our remarks being to stimulate progress, we shall, as in the former case ("Mechanical Brickmaking"), purposely avoid noticing or making any reference to any one's peculiar invention or patent process.

There is at the present time an immense amount of rubbish being used up in building that hardly deserves the name of "brick." By means of plastering on the inside and a selection of bricks having unbroken faces on the outside (and in some first and second-rate buildings facing-bricks outside), a passing appearance is given to the whole fabric; but when closely examined, what a ginger-bread concern it is! How short is the period of its duration! How expensive to keep in repair! And how unhealthy and unsatisfactory to the occupier, let him be landlord or tenant! As for bonding the wall, the bricks are worse than useless; so that walls built wholly of them may be said to be without any bond whatever, and therefore ready to split up the middle; and as the outside bricks absorb moisture to excess, they consequently swell and

contract during severe frosty weather and sudden thaws, so that the ultimatum may be more easily imagined than described. Add to this the bad mortar with which such rubbish is too frequently built, and the reader will readily perceive the chemical rationale why such buildings crumble so soon into ruin.

The so-called "practical men," who manufacture and use such rubbish, are never at a loss for an excuse for doing so. But what is its value in the vast majority of cases? We have even heard the latter defend himself by saying, "The sooner the rickety buildings made of his bricks crumble into dust, the better for the trade!" But is not the very contrary of this short-sighted and selfish policy manifestly the rule? Because a few isolated individuals may knock fortunes out of the exception, by a system of jobbing—anything but creditable to themselves and the trade, professionally and scientifically speaking—does that make it the rule?

It would be almost superfluous to say that the most durable bricks are absolutely required for agricultural buildings, along with the best quality of mortar. And the same may be said of roofing-tiles and draining tiles. In practice, the prevailing difficulty lies in convincing both the landowner and tenant what a durable brick really means, when any sort of rubbish can be had for less money. In such cases the schoolmaster abroad is evidently much needed; but even then the battle be-

tween hard cash and chemical philosophy would have to be fought on what may be termed "very doubtful ground." Hence the upshot.

The practical question in the march of chemical progress hinges upon the very little that is often required to make a very bad brick a good one in the manufacture. A landowner, for example, has a brickfield which produces a very inferior article; but by proper machinery for washing and removing grit (small stones and shells), and by the addition of a small quantity of marl, chalk, or lime from a different part of his estate, it would turn out a very superior and most durable brick and drain tile. And this is not all, the more interesting part of the story having to be told; for this latter durable brick would cost him actually less money out of pocket than the former—the inferior, gritty, crumbling one—owing to the command of water and marl, chalk, or lime upon the property. In other cases, where the water for washing, and marl &c. for mixing, have to be brought from a distance, there might be some extra money out of pocket for the improved article, but not nearly so much as is generally calculated; while it is still further below the additional value thus added to the produce of the brickfield.

To those practically acquainted with the details of brick manufacture, the *rationale* of the above conclusions as to cheaper bricks will appear manifest; but to those otherwise experienced it may not be out of place to add that it costs more to make the inferior brick from the bad materials than the durable brick from the good materials; and this extra expense is experienced both in the mechanical and chemical processes—i. e., both in the kneading, tempering, moulding, and drying for the kiln, and also in the burning; while there is a heavy loss of unsalable refuse in waste, broken rubbish in the former case, but comparatively none in the latter—the whole being readily purchased or used up—to say nothing of how the intrinsic value of the two articles are affected by the improvement.

Much has been said in books about the proper percentage of alumina, sand, and marl, or other material, as lime, &c., acting as a flux, so as to produce a close weatherproof durable brick; but in practice "the rule of thumb" is yet in the majority of cases the most reliable one, owing to the impracticability of determining these percentages, or ever attaining to their near approximation. In other words, an intelligent experienced brickmaker knows better how to mix and temper his clay by observation, than by a chemical analysis, owing to the different substances present in the clay, besides those specified, and the peculiar function they perform in the burning; and also often owing to the stratified character of the clay both before and after washing. The texture of the clay as to its fineness or coarseness of grain also affects the percentages in question, and likewise the degree of moisture necessary to the proper moulding, drying, and burning of the brick. In practice all these things must be carefully taken into consideration; but in books it is hardly possible to give them a hearing.

In the brickfield, therefore, the initiatory step in improving the quality of the clay is to try experiments in washing and mixing it with the best and readiest flux materials at command, such as marl, chalk, or lime. At first, the colour of the clay may deceive the eye as to the percentage of iron which it contains; but an experienced burner, when he sees the bricks coming out of the kiln, will be at no loss as to how far his experiment has been successful, and what additions the clay may require to bring it up to the required standard; and however laborious the work may be—however fruitless in disappointments when the manufacturer is only but a beginner—however trying to the patience it may prove, the work of progress should nevertheless be persevered in; for, when once the grand desideratum sought is gained, the result at all hands during the future is more money and less labour, and a higher degree of professional credit and trade: in other words, it is simply the difference between a good and a bad brick, and their respective consequences.

The next topic for consideration is the texture of the clay as to its fineness or coarseness of grain, and the percentage of water it should contain when ready for moulding. The practical question at issue is a very nice and important one, and has been keenly canvassed both in books and in the brickfield; but, as in the previous case, scientific deductions are of difficult application, in consequence of some clays requiring

more water than others, owing to differences partly in the fineness of the grain, and partly in the other substances of which kneaded clay is composed. Hence the practical man has no alternative left but to fall back upon his experience and skill, as forming the safest rule. And the experience of every successful hand-moulder of bricks informs him that the proper kneading and tempering of the clay in other respects has more to do with the moulding process and quality of the brick produced than the mere percentage of water which it contains; and the conclusion doubtless applies with equal force to machine-moulding.

In a scientific sense, the chemistry of these several processes of mixing, kneading, tempering, and moulding the clay is not more than sufficiently well understood to be practically useful, if so much. This chiefly arises, perhaps, from the scientific data involved being more of a mechanical nature than a chemical, such as the adhesion and cohesion of particles together. Practically speaking, the proper weathering, mixing, kneading, and tempering the clay, gives it a degree of toughness which it did not previously possess. Why? Because the particles, solid and liquid, are brought into contact in a manner so as to allow a more uniform application of the force of cohesion, attraction, and chemical affinity that naturally exists between them, and also of the compression of the atmosphere, than when these forces are counteracted by that of gravitation towards the centre of the earth. The particles forming a sandstone, for example, may be wholly held together by the force of cohesion, almost to the exclusion of chemical affinity, analogous to the particles of iron forming a bar of that metal. But in preparing the clay and moulding a brick, less or more chemical affinity also exists, which is greatly increased in the burning, provided the clay has been properly mixed and tempered. There are thus two principal forces involved; but between these two forces science is yet unable to make any distinction that is of practical utility to the brickmaker: hence he is left to grope his way as experience guides his various manipulations in the processes in question. At the same time, he ought to bear in mind the existence and even imperative importance of these forces, more especially chemical affinity, chiefly effected by fluxes, with the view to the improvement of his manufacture.

Do percussive force in the kneading and moulding, and the allowing the clay to lie and weather, increase the force of chemical affinity? And does the compression of the newly-moulded brick afterwards increase both the cohesive attraction and chemical affinity of the materials of which it is made?

Much might be advanced in support of an affirmative answer to both these questions. This has already been done to a certain extent under the previous article, on the mechanical department of the work. The workmen, for example, are familiar with the fact that after the clay has been properly "weathered" during the previous winter, and a second time after the process of pugging and the work of kneading and moulding began, the more expeditious the several manipulations are performed, and the greater the amount of percussive force employed, the more successful the result of their labours. Beginners fail by turning out badly-tempered clay, and friable ill-formed bricks, because they go about the work so slowly, all the manipulations being performed in a hesitating, doubtful, and unworkmanlike manner. The moulder, who is dashing in the clay, and turning out his 5,000 bricks of the best quality daily, may hand a stranger his mould to try his luck; and if this stranger has never put his hand to the moulding before, the finale is bad bricks, and few of them. The difference is conspicuous enough. Hence the inference to be deduced from the facts of the case thus briefly premised.

In the chemistry of the process of drying there is perhaps less that requires special notice. Success mainly depends upon the uniformity of the process, so that one part of the brick shall not dry more rapidly than another. Water has a greater affinity for clay than sand, but if the two have been properly incorporated together little harm will be experienced. But if there are small stones or the like in the brick, or if these have been crushed and the broken dust not properly incorporated with the clay, then in both these cases the bricks will crack less or more in the drying. To the naked eye the cracks in many instances may not in the sun-dried brick be visible, but in the removal of the bricks from the kiln the cracks will make their appearance.



A great deal has been said about burning bricks, a great deal more in the same opinionative style might be added, but without advancing a single sentence to improve the work, simply because fire-side truisms cannot be heard in the brick-kilns. If the bricks have been properly prepared for the kiln they will be easily burned; but if otherwise, all the burning and other et ceteras usually advanced will not turn out a good manufacture. No doubt the heat should be equally distributed throughout the kiln, in order to make good work; and no doubt also to effect this is a grand desideratum, and in the majority of kilns this has been approximated, if not wholly attained. But the majority of kilns, nevertheless, do not turn out well-burnt bricks. And the reason is, because sufficient attention has not been paid to the chemistry of the previous processes already noticed, relative to the first weathering, mixing, pugging, and second weathering and moulding of the clay. The proper manufacture of bricks in these respects is highly conducive to the after-process of burning; while the *vice-versa* rule is equally in force, being adverse to the process of burn-

ing. No doubt to a few there is yet something very mysterious in the agency of fire, and therefore it is not surprising if they in a baffled hour lay all the blame upon this unknown agent for the badly-burnt bricks that come out of the kiln. But after all, man has not a more faithful servant than fire, or one that is more easily controlled in the brick-kiln, with a moderate degree of caution. The kiln itself is as seldom to blame for the bad quality of the bricks as the fire. Others give battle to the winds of heaven, because they won't allow the fire to burn and the kiln to draw equally. But in nine cases out of ten, is not this putting both common sense and patience into the frying-pan? The best method of filling the kiln is doubtless an important problem, but its practical solution is only a work of a few experiments. The successful burning of the brick is the true index to the progress made in the preceding manipulations of the work; and therefore whenever something wrong is indicated, the true plan is to go back and begin at the beginning.

### LORD BURY ON THE CATTLE DISEASE.

At Norwich, Lord BURY said some information had come into his possession within the last two or three days of such importance that he felt it was only due to the committee to ask the Chairman's leave to bring it before the meeting. It was reported a short time since that the Dutch had been exceedingly successful in the cure of the rinderpest, and the homœopathic body decided on sending out one of its most distinguished members to Holland to investigate the subject. Dr. Hamilton was the gentleman requested to go out, and he was furnished with a letter from Earl Russell to the Government of Holland. He started on his mission last month, and he was put in communication with the burgomaster of Schiedam, which was situated in the very centre of the district infected with the cattle-plague in Holland, and obtained from him the most authentic information. It was not only the homœopathic method of treatment which had been exceedingly successful in Holland, but the allopathic method had been exceedingly successful also. The information which he was about to detail would prove most conclusively that the argument that the rinderpest was incurable was not to be sustained for a moment; and if the facts which he advanced could be proved—as he believed they could be—they would knock on the head the absurd system on which we had now entered of killing every beast as soon as it was attacked, without making an effort to save it. About the middle of August the Dutch Government became aware that the rinderpest had broken out in Holland. It first of all attacked a place near Rotterdam, called Kethel. It was distinctly traced to a cargo of cattle which had been sent from Rotterdam to the London market, which had remained ten days in London, and which had been sent back. On the appearance of the disease, the Dutch Government immediately drew a *cordon sanitaire* for a considerable distance round Kethel. Agents and sentries were appointed to watch all the roads, and to prevent any movement of stock outside the infected district, which contains about 250 square miles. The success of the *cordon* had been established by the fact that, while within it about 5,000 cases of the rinderpest had occurred, outside of it there had been only three cases. The Dutch Government was very particular in preventing the passage, not only of cattle, but also of dung, hay, straw, or anything which could be supposed to have come in contact with diseased cattle. As to the general treatment of the disease, it was the expressed opinion of the Dutch veterinary surgeons that it was highly contagious, that it was communicable by direct contact, and even by approaching within a wave of air with a radius of about 9 feet. They also said that they believed it had been communicated, not only by hay and straw which had been brought into contact with diseased animals, but even by birds which had settled on diseased animals.

Mr. OLDFIELD asked whether these remarks applied to cases of cattle only.

Lord BURY: Yes. Phenic acid, which had been hitherto used as a means of preventing decomposition, had been found in Holland of the greatest use as a disinfectant. Many of the

veterinary surgeons in Holland believe that the disease was of a parasitic origin, and on that ground they tried phenic acid, and with considerable success. Holland was divided into 197 communes, and the Government appointed a veterinary surgeon to each commune. The veterinary surgeon of each commune had to account every week for the whole number of cattle within his district, having to state the number of cattle in it, the number attacked, the number dead, the number cured, so that the most accurate returns had thus been secured of the progress of the disease. There was one fact which he could not help bringing under notice, viz., that although the movement of stock was entirely prohibited from one part of Holland to the other, yet the export of unsound cattle from Rotterdam to the London market was still continued and was still sanctioned. In reference to the question put just now, he might state that no animals except horned cattle and those inoculated had taken the disease. It was found that animals treated in the open air yielded to the remedies applied much more readily than animals treated in sheds. The symptoms of the disease as they occurred in Holland correspond in every particular with the symptoms which were here described as being characteristic of the disease throughout England. Among the general preventive measures adopted, cow-sheds were carefully cleansed and washed with gas-tar, carbolic acid, and water. It was found necessary to be very careful with preparations of chlorine, as they affected the lungs of animals declared convalescent with respect to the rinderpest. Various other plans had been adopted in Holland. Creosote had been tried, but not with success; a stimulating treatment had been found to be injurious; and inoculations had been fatal in all cases. There had been treated altogether in Holland 4,700 cases of rinderpest, and of these 45 per cent. had been saved. This 45 per cent. included the results attained with experiments made by the homœopaths; the latter dealt with a small number of beasts only, but they saved 75 per cent. of those which they treated. There were 197 communes in Holland, and of these 71 were affected by the disease. All of them were enclosed within the *cordon sanitaire*, and on the 22nd of October twenty-five of these communes were pronounced to be again free from disease. The total number of animals attacked up to October 21, 1865, which was the latest return he had seen, was 4,798; of these 1,031 were killed, leaving 3,767, which were treated either by the allopathic or the homœopathic system of medicine. Of these 3,707 animals 1,276 were cured and 1,071 died, leaving 790 at the date of the return under treatment. A considerable number of these 790 must have recovered, because the official statistics to which Dr. Hamilton had access stated the proportion cured to be 45 per cent. This return included the commune treated homœopathically, in which 72 per cent. of the animals treated were cured, subsequent returns bringing the proportion up to 75 per cent. The ordinary (allopathic) method of treatment had been most simple. The practice had been to dilute muriatic acid combined with linseed

tea in one or one and a-half drachm doses, giving frequently as much as five drachms per day, sometimes combined with gentian, tormentilla, and ginger. It had also been customary to dilute sulphuric acid, combined with sulphate of quinine in equal parts. These were the principal allopathic remedies, and they saved 45 per cent. The external use of phenic (carbolic) acid, in the proportion of eighteen drachms of the acid to forty quarts of water, had also been adopted, the eyes, nose, &c., being washed with the mixture three or four times per day. Vinegar and tepid water had also been used. The external use of carbolic acid as a prophylactic had been attended with advantage. Rules of diet were very carefully observed, and the feeding of beasts with distillers' grains and refuse was prohibited by the Government, because it was found that it predisposed sound cattle to attack, while those which were attacked were invariably carried off more easily. From the great soreness of the lips and mouth it was most difficult for an affected animal to eat, and it was found necessary to place food, consisting of small quantities of hay and oilcake, far into the mouth by hand, by which means the vital powers were sustained during an attack. He now came to the homoeopathic mode of treatment. He thought he should be able to change the smile which he observed into a look of admiration before he had done. The details which he was about to state were offered by the homoeopathic body to the Royal Commission just before their last sitting, and it was generally understood that the lay members of the commission were anxious to enter into them. No doubt, however, the commissioners had heard a vast amount of twaddle in the course of their inquiry, and the medical members of the commission, whose time was worth five or six guineas an hour, felt indisposed to enter into details of treatment with which, *prima facie*, they did not agree. He thought they were wrong in rejecting this evidence, because no one could say what it was worth without hearing it. As, however, the Royal Commission had decided not to examine Dr. Hamilton as a witness, it became the duty of every individual to give as much publicity as possible to the facts. In Berkshire, and in some parts of Scotland, the same course had been pursued, and the farmers and landowners were being put in possession of the facts by other means than examination before the Royal Commission. In September, when the cattle plague was raging in Holland, two Belgian gentlemen, M. Gandy, a member of the Veterinary College, Brussels, and M. Sentin, a homoeopathic chemist, offered to the Dutch Government that if a district were put under their charge, and they would not allow them to be interfered with, and would not require them to make a report until a sufficient number of cases had been treated, they would on their part give their services gratuitously, and try the system fairly. This was accepted by the Dutch Government, who agreed to give a commune up to the homoeopaths, it being understood that the veterinary surgeon of that commune should be required to certify that every case which came under homoeopathic treatment was an actual case of rinderpest. Matterness, the district assigned to the homoeopaths, was a commune situated in the very centre of the infected district. The peasants and proprietors were somewhat prejudiced against the homoeopathic system in the first instance, and did not enter cordially into

the views of the homoeopaths; but before the termination of the experiment they were greatly pleased with it, and gave every assistance in their power. At the commencement of the experiment the proportion of cures effected out of the animals attacked was 70 per cent., but in the latter weeks the homoeopaths saved nine out of every ten cattle which came under their treatment. Matterness was situated within a mile of Kethal, in the very centre of what had come to be styled the "black district," so that the homoeopaths did not enter upon their task under peculiarly favourable circumstances. They commenced it September 22, and eighty beasts came under their care, each case being certified by the veterinary surgeon as one of actual rinderpest. Of these eighty animals sixty recovered and twenty died. Besides these, 280 beasts in the commune were put under prophylactic homoeopathic treatment; twenty-five took the disease before the treatment had had time to work, but in the fourth week no fresh case had occurred, and on the 31st of October the commune was pronounced free from disease, and had remained free from that time to the present. A large proportion of the cattle attacked in the commune of Matterness had been treated by the allopaths before the homoeopaths came into the district. In all, 189 cases came under treatment, eighty under the homoeopathic system, and 109 under the other. As seventy-three cures only were effected, of which sixty were attributed in an official report to the homoeopaths, the balance was largely in favour of the homoeopathic mode of treatment. To the seventy-three cured ought, however, to be added a portion of those still reported as under treatment, as some of them no doubt recovered. The remedies which were employed by the homoeopaths were arsenicum, phosphorus, phosphoric acid, rhus tox., and sulphur. It was found that all cattle could not be treated alike, as every case had to be dealt with on its own merits. Mere details proved, he thought, that the disease was amenable to treatment, and that our plan of knocking on the head every animal which happened to be attacked was barbarous and unwise. He observed by the Privy Council return, published in the *Times* of Friday, that only four per cent. of the animals attacked in England had recovered; and when they thought of the vast amount of property which was sacrificed by an ordinance which he could not but consider most tyrannical and unjust, as it ordered a man who had the misfortune to have a beast attacked to kill it without remuneration, the farmers of Norfolk would hardly be inclined to allow such a state of things to continue if they could help it. The homoeopathic body felt that the statistics which he had quoted were of no use unless they were brought to some practical result; and if a veterinary surgeon were allowed to certify that each case assigned to them was one of rinderpest before they treated it, and if they had a sufficient number of cases to enable them to make a fair average, they would undertake that a competent veterinary surgeon should come to take the case in hand, and a leading firm of homoeopathic chemists had also agreed to give the necessary medicines free of cost. All this might, perhaps, be called empiricism, quackery, and nonsense; but if the farmers of Norfolk would only look into the facts of the case, he thought it would be satisfactory for the county and for their own pockets,

## THE BEST METHOD OF TREATING LAMBS AFTER WEANING TIME.

At a meeting of the members of the Kelso Farmers' Club lately held, Mr. Purves, Linton Burnfoot, presiding, and with a full attendance, a discussion took place on the question, "What is the best method of treating lambs after weaning time?"

Mr. MUNRO, who introduced the subject, said—In engaging last month to introduce the subject for discussion, I was well aware that I had no new practice to advocate or wonderful discovery to promulgate, but I did it rather with the view of merely commencing the discussion, for undertaking which duty there seemed to be some difficulty in getting any one to volunteer, and thereby throwing all the trouble on our permanent Chairman. Therefore I hope I shall be excused if I only go over ground well known to all the members of this Club,

The subject for discussion suggested last month by Mr. Wether- spoon was, "The best method of keeping lambs from the time of weaning to the time they are put on turnips." This, you all know, is a critical time to our lambs, as by mismanagement a great loss may be sustained. If they get a check at this time, it takes a long period and a good deal of feeding before they recover the lost ground; and if kept on unsuitable food, such may cause a serious decimation of their numbers. So far as my observation goes, almost the only plan to take with them is to give them a change to a fresh pasture, and, if possible, to young grass, and to watch them carefully, so as to mark in its early stages any tendency to purging, which, if allowed to go on, if it does not kill them, reduces them rapidly in condition. On purging being noticed, the lambs should be removed, if at

young grass, to a clean field of older grass, and *vice versa*. I do not think anything further can be done, though sometimes benefit follows the administration of oil and laudanum, or an occasional feed of corn, if they can be induced to eat it. This year I have lost a few by a disease which has much the appearance of quarter-ill, when the discoloration does not come to the outside. It is not the lambs that are purged that are thus affected. They are carried off rapidly. After taking off the skin, the flesh appears sound enough; but when cut into, it is quite black, especially the hind quarters. This, I have no doubt, is brought on by the rapid growth of grass forced forward by the warm weather following the rain we had at the beginning of harvest. In trying to show how this change of pasturage of lambs may be most easily effected, the different circumstances under which farms are managed must be taken into account. The different systems may be divided generally into three classes. 1st, Those farms on which merely the stock of grey sheep bought in yearly, say at St. Boswell's Fair, and which are sold off nearly altogether before another lot is purchased; 2nd, Those on which a full stock of ewes are kept, and merely the ewe lambs to renew the flock; and 3rd, Those keeping a stock of breeding ewes, and also their own lambs. With regard to the first, they have the least trouble in finding food suitable for the young stock. The greater part of their last year's purchase will have been sent to market before the season again comes round, when they have to buy in for another winter. Their fields will be clean, and not overgrown with aftermath. The lambs should do well at once, any weakly ones or cases of scouring being removed to the hay field, and after harvest to the stubbles. Those who follow the second system of farming have rather more difficulty in carrying their lambs from weaning to turnips. Their fields, from the time that the lambs are sold off, are very lightly stocked, and the foggage is ready. After that is consumed, the barley stubbles are available, and the longer the lambs are kept going forward on grass there is not only a saving of turnips, but they do not so soon lose their teeth, and are able to break the turnips for themselves to a later period in spring. Under the third system, the greatest difficulty is found in keeping the lands thriving, as the same stock is on the lands that has been there all summer. The best plan, I think, is to take grain sown down without a crop or a foggage after hay in addition to the farmer's own. If these cannot be procured, a hill grazing may be taken for a few weeks, which, although it may not put much condition on the lambs, gives at least clean food in the mean time, and allows the grass on which they have been weaned to clean and freshen. Another plan that might be tried on farms with small fields is to teach the lambs to eat cake before they are weaned. This might, I think, be done (although I never saw it tried), by allowing the ewes to come to boxes at first, and then gradually and quietly keeping them back. The quantity allowed to lambs would require to be increased after weaning. A fourth class might also be made from those who sell part of their lambs, and feed a considerable number; but their management cannot differ in any degree from that of other classes, with slight modifications to suit varied circumstances.

The CHAIRMAN said the management of lambs was one of the most difficult things they had to deal with, and there were more deaths at the early age of weaning time than all the rest of the time a sheep lived. His opinion was that sheep stock bred on whinstones should be put on red freestone, heavy clay, or limestone. If they remained on the farm on which they were bred, they would go to wreck and ruin. After about a month or six weeks they came home to their regular pastures in a good healthy condition, resulting from the change. He considered also that giving the lambs a supply of cake was a very excellent thing. They should be taught to eat it when early lambed—a week after birth in fact—which would make them eat it after they were weaned, and which would improve them a hundred per cent. A person who kept all his lambs was often in a difficulty to find food for them after they came home from the summering. This year, he (the Chairman) had tried another plan. He had some twenty acres of tares, upon which he put his lambs, and they soon took to the eating of them out of the ricks. This was the first year he had tried them, and in a year like this, when they had a superabundance of grass, tares were far more preferable than heavy clover. With this kind of feeding, out of 23 scores he had this season only one lamb dead. If they

could only keep the rush from their lambs, they would go on well, but with it they went fast to ruin. He would advise those who had farms of 500 acres to sow about 20 acres of tares for the use of their lambs. Such had been his experience this year, and he intended to carry it on.

Mr. SIMSON, Courthill, said the best plan was to learn the lambs to eat cake early, and after they had been weaned to give them a mixture of corn and tares, the latter being eaten from hecks. He disapproved of sending them away to other pastures; his practice was to keep them on the same land. This year, he had as good young grass as could be desired, yet he had been losing them right and left.

The CHAIRMAN remarked that last year he had got a quarter of winter tares, which were sown in October on three acres of ground, and turned out a splendid crop, one-half of them being cut twice, and the second-cutting proved better than the first. The first cutting, he might mention, took place about the end of May.

Mr. ROBERTSON, jun., Ladyrig, said that on the whole he agreed with the remarks of the Chairman. Upon the farm of Ladyrig there had been no deaths among lambs to speak of this year, but those that did occur he attributed to the overgrowth of grass proving too strong. They usually put their lambs on foggage for some hours a-day. After the foggage was done they were turned on to stubble. The symptoms of the disease which had proved so fatal among their lambs were nearly the same as those described by Mr. Munro. Some of them had a slight rush, and some of them had none. They died very soon after being taken ill, sometimes in less than an hour, and swelled after death to an immense extent. He had lately caused the shepherd to put a piece of rock salt into each field, and since then no deaths had taken place; but whether the salt had been the means of stopping the mortality he was not prepared to say.

Mr. BURN (Ednam West Mains) differed a little from the opinions expressed by the Chairman. He knew that people sent away their lambs, and succeeded in saving a great many lives; but at the same time it might be questioned if they gained much by sending them away, because they lost a great deal in condition. For his part he preferred to keep his lambs at home, and he thought he could save their lives too. He thought it of great importance to teach them to eat cake at an early stage. If they could manage to allow the lambs but not the ewes, to get into another field than that in which they were pastured, and have cake placed in the field on which the lambs could feed without the mothers getting at it—he did not think it beneficial that the ewes should get cake—it would be found an excellent way of getting them to eat it early. He was also in favour of putting lambs early on turnips; but whenever they intended to change their kind of food, they should always do so by degrees—always, as it were, preparing them some time beforehand for what they were coming to. Mr. Burn then mentioned that he had a great many deaths among his hoggs, sometimes at the rate of one per day. They were sometimes found dead in the morning just as if they were sleeping; and he found that soon after death they had a dreadful smell, so bad, in fact, that he would never think of having them skinned, since any one merely touching them with his finger could not get quit of the smell for a whole day. As to their colour, the flesh was soon as black as his hat. He thought it was something like the black spall in cattle. He thought it was good for them to change them from one field to another, and when changing their food to do so gradually.

**EARLY MILKING.**—Cows should be milked early in the morning, so that they can feed on the dewy grass. Two hours of such feed is worth as much as that of the rest of the day towards giving a good flow of milk. So wake up, boys, at father's rap on the partition wall, and hie to the yard with pail in hand, and have the cows in pasture before anybody's else. Be sure and milk clean. A boy who will always milk clean will have a good recommendation of being faithful wherever he goes, and such a recommendation always goes a great way among business men.—*Mains Farmer*.

## THE CATTLE PLAGUE.—THE GOVERNMENT AND THE VETERINARY SURGEONS.

The discussion over the cattle-plague would now seem to centre over the consideration of two certainly very material points—Should the outside world, the general public, or the agricultural interest fall foul of the Government or the veterinary profession? Upon more mature reflection, however, it will be found impossible to separate these two subjects, as the Administration has simply done as the veterinarians directed. If wholesale slaughter has been countenanced—if the utter abnegation of the old English principle that every man's house is his castle has been admitted of, so much has been sanctioned rather at the instance of a veterinary professor than by the order of a Home Secretary. No one can say but that her Majesty's Ministers have shown themselves really alive to the necessity for action. Instructions are being continually issued. Commissions of inquiry have been instituted, and the most practical of prohibitive measures have been enforced. And yet, at the meeting of the Farmers' Club, the tone of the debate evinced an inclination to disparage the Government at the same time that it upheld the veterinary profession! Thus Mr. Charles Howard, who read the opening paper, clearly sympathized with the cattle doctors, and "the most unfair" manner in which these gentlemen have been treated in certain quarters; while any remedy not proceeding from the profession must emanate from "a quack," who has vinegar, carbolic acid, or gypsum to sell; as due allowance must be made for the "proclivities" of the homœopaths. Professor Simonds, who was present, took up this wondrous tale, for "it was a most extraordinary thing that farmers and shepherds should set up their opinions on this question against those of the veterinary profession;" or again, "we see men who know nothing about medicine, and do not perhaps even know the names of the organs in the animal's body, setting up their notions as to the curability of this disease against ours." The learned Professor characterized all this as "amusing;" but there was a certain irritability of voice and gesture associated with the expression that scarcely realized the phrase in its primitive sense. Let us, though, look a little closer into this matter. What do the Professors and their disciples know more of the cattle plague than the farmers and shepherds and other outsiders who cannot tell you even the names of the organs in an animal's body? *Nothing*. What have they done more than we could have done for ourselves? *Nothing*. Assume that so far we had been living in a kind of Golden Age, in a modern Arcadia, as it might be where veterinarians were unknown, and that this terrible plague had broken out amongst our herds. How in our ignorance and utter imbecility should we have acted of our own accord but as these veterinarians now advise us to do? Should we not have drawn cordons round infected districts, and have slaughtered forthwith every suspected beast so reported? Or, even as to symptoms and premonitory signs, are not farmers and shepherds, and people who do not know the names of organs, often to be trusted as much or more than many of the duly qualified practitioners? There can scarcely be a reader of this paper, but who could cite cases of animals which have been condemned upon authority as having the rinderpest when they had nothing of the sort, as others after examination have been suffered to go at large with the seeds of the disease gradually if not rapidly developing. The veterinarians declare, in point

of fact, in so many words, that they can do nothing; and if accordingly the malady is to be stamped out, if heretombs are to be offered and homesteads to be invaded, it is not so much the Government as the profession which must be made answerable. Still Mr. Simonds has preceded to support him; for, as he tells us, it is not only the plague in animals, but typhus, cholera, and small-pox in the human frame are equally incurable. A hundred years since, or in an assemblage of savages, a man might have declared the small-pox incurable, but such a doctrine will not do in these days; and if cholera or small-pox can be successfully treated, so surely may the rinderpest. Mr. Howard almost sneers at the homœopathist, as he does more directly at the quack who has something to sell, and we do hope that we have as great an objection to puffing pretenders as most men, but how stands the case? What have the veterinarians to sell here? *Nothing*; neither knowledge nor drugs. Then surely we are justified in looking to some other quarter, remembering as we must that some of our greatest discoveries, some of our most valuable improvements, have been made by men who might not know the technical terms for the very instruments they were employing. Professor Simonds informs us somewhat magnanimously "what we are going to do"; and that is "we are going to let the homœopathists have a trial." We should rather think we were, too, after all Lord Bury has said as to the cures that had been effected in Holland. It may be all very well for Mr. Smallbones, Colonel de Butts, or other gentlemen residing abroad, to sit down in despair when the plague makes a visitation upon them; but that is surely no reason why we here in England should continue hand-tied. If the Government will deserve censure hereafter, it will be for putting too much reliance upon an agency that has no power. Veterinary science has had ample scope and opportunity, and now let us, if anything, rather go out of the way to give the other professors a chance. Let it be not merely the homœopathist whose prescription shall be put to the test; but let every one who thinks he can do good be called upon, even if the remedy be made to depend upon what, as Mr. Howard has it, he may have to sell, whether vinegar, carbolic acid, or brandy-and-water. A greater part of the evening at the new Club House was spent in tracing the plague to foreign parts, and Professor Simonds certainly worked out this theory with much tact and ability, but still without any direct evidence whatever from facts. We do not care to dispute the deduction, but in a remarkably sickly season it would have been curious if cattle had escaped. Some of the most fatal disorders have appeared amongst the human race; wild animals, like hares and rabbits, have been found dead by the score and the hundred, and horses and sheep have been struck down with what is declared to be not the rinderpest. If hares and rabbits were as valuable as cows and oxen, we might proceed more elaborately to trace the origin of their ills; but, as it is, we are content to put them down to the sickly season.

Beyond the lengthy addresses of Messrs. Howard and Simonds, there was little or nothing in the Club debate that can provoke much profitable comment; and, as taking the question from a farmer's point of view, the business of the evening will by no means compare, for useful results, with many a previous meeting of the same society. The report, however, which we give in full, can

now be pointed by that emanating from the Royal Commissioners, as published on Saturday. We gave the substance of this document when we stated some time since that it would "recommend the adoption of the most stringent steps to guard against contagion. Fairs, markets, shows, and auctions are for the time to be abandoned, as the transit of beasts, save under certain restrictions, will be interdicted, and beef rather than cattle be the commodity in which salesmen must deal. It is rumoured, moreover, that the several clauses, as carried, are worded so strongly that the agricultural element on the Commission withdrew from a division in which they were so continually in a minority, and that the scientific men have here again pressed in their point as to stamping out the disease being the only effectual way of subduing it. The evidence, to be sure, went much the same way, and agriculturists from the east and the midland counties, gentlemen whose names carry weight with them, have expressed themselves as strongly as the Commissioners, who can turn to such testimony in support of the conclusions at which they have arrived." At the head of the dissentients we find the agricultural

element, as represented by Lord Spencer, the President of the Smithfield Club, and Mr. Sewell Read, the Member for Norfolk, who, with Lord Cranbourne, and Mr. Bence Jones, have issued a separate Report of their own, *against* the total stoppage of all movement of cattle. The Report of the majority runs to great length, as in fact it is too wordy; while a deal of space is occupied in tracing the origin of the disease. The Commissioners here go over much the same ground that Professor Simonds did at the Farmers' Club, while these gentlemen are fain to admit that this history is but a theory at best:—"The facts, though by no means inconsistent with the theory which attributes the appearance of the plague in England to the Revel cargo, fall far short of establishing that theory, unless we assume that the event cannot possibly be accounted for in any other way. Further inquiry may throw new light on the question. At present we are not able to pronounce a decided opinion on it; nor, for the practical conclusions which we are about to offer, is it material on which side the truth lies." We thoroughly agree with this deduction; and for the future it will be well to keep a little closer to what really is *material*.

## CENTRAL FARMERS' CLUB.

### THE CATTLE PLAGUE.

The first meeting of the Club, after the usual autumnal recess, took place on Monday evening, November 6, in the dining hall of the Salisbury Hotel, where there was a large attendance, amounting to more than 100 members, drawn together by the importance of the topic, namely, the cattle plague, now raging throughout the country. The subject placed for consideration in the programme for the year was that of *benefit societies*; but, in compliance with the wish of the committee, Mr. Chas. Howard consented to substitute for it the question which has recently absorbed the attention of farmers and graziers.

Mr. ROBERT LEEDS (West Lexham, Norfolk) the chairman for the year, presided, and, in opening the proceedings, said, In welcoming you to our new home I am only sorry we do not hold our first meeting here under more encouraging auspices. It has been usual, I believe, for your Chairman on the occasion of our re-assembling to say a word or two on the past harvest, while all I can tell you is that in my own county of Norfolk, it has been the worst either for wheat or barley that I have known for many years, more especially on the mixed and light soils. But this, gentlemen, is not our only difficulty, for we are assembled here to-night to consider one of yet more pressing importance, and of which we have also known the effects in the East. I may say that the Committee have long felt the necessity of taking this matter up, but knowing the difficulty of getting farmers to London earlier it was thought better to postpone the question until the November meeting. As you are aware, the name of Mr. Charles Howard stood upon the card associated with another subject, and I am sure that gentleman deserves the best thanks of us all for the readiness with which, at much personal inconvenience, he fell in with our wishes, and agreed to take up instead a topic of so much national importance. I shall in no way attempt to anticipate Mr. Howard's paper, or refer here to what has been done by the Government or other societies. But having, as I had expected, a very large meeting, and many gentlemen having no doubt something to say, I would urge the necessity of these remarks being put as

concisely as possible. It would perhaps be better indeed that I mention two or three of the chief rules of these discussion meetings, which are as follows:—"That none but members of the Club address the meeting except by special invitation."—"That the introducer of the subject have the right to reply, but that no other member address the meeting more than once."—and, "That no one but the introducer of the subject occupy the time of the meeting for more than a quarter of an hour."

Mr. CHARLES HOWARD said: Gentlemen, I must congratulate the club on the attendance of so numerous and influential a company as I see before me this evening; and, indeed, had I known that I should have before me such a formidable assembly, I should perhaps have been more chary about giving my assent to introduce the subject which is now about to be discussed (cheers). I appear before you this evening as a farmer. I do not pretend to any great knowledge of the veterinary art, or to be possessed of more information on the subject for this evening's discussion than could have been acquired by any man of ordinary intelligence, who had read the newspapers and other publications of the last few months. I would say at the outset that I hope you have not come here to-night expecting to hear how to cure the cattle plague; this I am content to leave with those who have made it their especial study, my endeavour will be to treat the subject from a farmer's point of view. When it was intimated to me, about a month since, that the committee deemed it desirable that the Cattle Plague should be the subject for discussion at our first meeting, instead of that of Benefit Clubs, which I had undertaken to introduce, I entirely agreed with the opinion expressed, and at once wrote to our Secretary to suggest the names of gentlemen conversant with the subject, who should be solicited to take up the question. I believe these gentlemen were applied to, but without success; such being the case, and feeling the great importance of the matter to the farmers and graziers of England, as well as to every other class of the community, I could not refuse the request to bring this subject under the notice of the Club. It is my intention to sketch briefly the history and nature of the disease, to notice

its appearance in this country, and to remark upon the curative and remedial or preventive measures. It will be remembered that when the alarm note was sounded by the veterinary professors upon the appearance of the cattle plague in England it was treated very lightly, both by the public and the farmers, the opinion, in some quarters, being that it was an endeavour on the part of one or more of these veterinary gentlemen to write themselves into notice and place. Those, however, who were acquainted with the frightful ravages the disease had made in the herds of every country in which it had appeared, felt that the agricultural interest was about to be exposed to one of the greatest calamities that could overtake it. First, then, as to its nature and history. It appears that cattle plague, which differs not only in intensity but in kind, is no new disease: it was known, according to some authorities, as long ago as the third century. We read, also, of a grievous murrain in the time of Moses, whether akin to the present murrain or not we have no evidence. It has at various periods committed fearful havoc among the cattle of several countries on the continent and in more distant territories. It is stated, that from the year 1793 to 1795 it destroyed in Italy between three and four million animals, and in France, from 1713 to 1796 not less than ten millions. Upon the whole continent of Europe it is computed that some two hundred millions of cattle perished from cattle plague during the last century, and in more recent times in Russia one million have perished in a single year. In Egypt it was introduced in 1841, by the importation of foreign cattle, and in three years some 350,000 were destroyed. I learn also from my brother, who has lately visited that country, that in the year 1864 above one million head of cattle died there, so great was the mortality, that the Egyptian farmers, left without draught animals, were driven to mechanical appliances for the tillage of their soil; hence the large orders that were received in this country a year or two since for steam engines and steam ploughs. From the best veterinary authorities in our own country and on the continent we learn that the spontaneous development of rinderpest takes place only in the East: as, with cholera morbus, this appears to be its natural home. Various causes are assigned, such as the soil, climate, its peculiar vegetable products, and the breed and management of the cattle. I learn from some writers on the subject, that true rinderpest is simply malignant typhus fever; but that another kind or form of the murrain is typhoid fever, accompanied by inflammation of the lungs, or aggravated pleuro-pneumonia. Other varieties of the murrain are described, into which I do not propose to enter; what we have to do with is the type or form of the murrain now prevailing in the country, which is said to closely resemble, if not to be, typhoid fever. It is undoubtedly much more contagious than any known disease, either of man or animal: so much is this the case, that these same authorities consider it can be and has been carried from diseased to healthy cattle by dogs, sheep, goats, and even marching armies, while the soldiers and other animals have been unaffected by it. Some go so far as to maintain that flies even are carriers of the poison. As to the question whether sheep being brought into contact with diseased animals take the disease or not seems at present a disputed point. In my own neighbourhood, a number of sheep belonging to a friend of mine have been grazing in the same field in which were a number of badly diseased bullocks, and although they ate the food upon which the bullocks had breathed, and a portion of their saliva had fallen, up to the

present time no harm has befallen the sheep. It is therefore open to question whether, in the much discussed Norfolk case, the sheep were the victims of this dreadful scourge; upon this, however, we may hear more this evening. The disease does not develop itself for some days after coming into contact with diseased animals. As to the precise time, however, great difference of opinion exists: some say for from four to fourteen days, others to twenty-one days. It may be known from the following symptoms: Great dulness, frequent twitchings and shivering, staring coat, arched back, drooping head, with a mucous discharge from the nose, reddened eyes, with a watery discharge, quick and short breathing, ulcerated lips and roof of mouth, cessation of rumination, with diarrhoea or dysenteric purging; the animals rapidly sink, and die in from twelve hours to eight or ten days, in most instances the second day, after falling. The cattle plague first made its appearance in England in 1744, and remarkably enough, as in the present outbreak, the cows near London were its first victims. Various accounts are given of its introduction, but most agree that it was an importation. It raged with more or less virulence until 1757, when it ceased, after having destroyed many hundreds of thousands of cattle. Great alarm was felt then as now, Orders in Council prohibited the holding of fairs and markets, and ordered all beasts showing symptoms of the plague to be destroyed and buried. Various reasons were assigned for its appearance, pamphlets were published, some writers endeavoured to show, as in the present instance, that it was a visitation of Providence for the sins of the people. The famous Dr. Cullen tells us that it is a judgment of the Almighty for our gross superstition in cattle worship, or in other words, for the undue attention we bestow upon our animals. The celebrated Dr. Cumming, when at Bedford, the other day, expressed almost similar sentiments—sentiments, however, which will find no echo in a farmers' club. My own opinion is, that our animals have not had attention enough, particularly in their transit through the country, and their exposure to the vicissitudes of our climate when in the hands of the dealers. At the appearance of the cattle plague in England in the present year, conflicting opinions again arose as to whether it was an imported contagious disease or an epidemic, or, as the veterinary profession more properly express it, epizootic, spontaneously breaking out in the orchards of London. Many letters and articles, some of an angry character, appeared in the daily papers, with regard to one of these organs, which for many years led the public mind, and doubtless at times has swayed the Government, and to which England is indebted for the great ability it has brought to bear on public questions, its conduct towards our leading veterinary men I maintain was most unfair, because these gentlemen gave expression to an honest opinion that the disease was imported, no language was too severe to apply to them; if the section of the press to which I allude had prevailed upon the country and the Government that the plague was epizootic, it would have been all but useless for the Privy Council to have taken action in the matter. Had it been atmospheric, no precautionary measures would have availed in arresting the progress of the disease, it would long ere this have travelled from parish to parish, until the whole country would have become infected. On the other hand, numerous cases have happened in which prompt measures have sufficed to arrest and stamp out the disease in the locality. It was curious that the parties who came prominently forward to uphold the epidemic theory were

either interested in the cattle trade or were over-zealous supporters of the system by which foreign cattle are admitted; while, on the other hand, it was held to be a contagious disease—and that an *imported one*—by men of the highest standing in the veterinary profession. Latterly, however, the epidemic view has been dropped by the press; and, from the experience of the past few weeks, I think—to say nothing of the origin of the contagion—he would be a bold man indeed who would stand up and defend this theory. I am aware that statements have been put forth of spontaneous outbreaks; but well-authenticated proofs of spontaneous generation, as far as I know, are not forthcoming; on the other hand, however, we have cases without number where the disease is clearly traceable to contact with affected animals. To confine myself to my own district, I may state that in every instance the attacks can be traced to the introduction of diseased animals. The first case was through the purchase of London calves at Leighton Buzzard market; the next at Harlington, through the purchase of diseased bullocks at Newport Pagnell fair; another at Marston, where a diseased cow was driven through a lane, a hedge only parting it from some grazing bullocks—these immediately took the disease. Mr. Kilpin (a member of this club), the owner of the cattle, and who has lost thirty-three, occupies another farm (Bickerings Park) some three or four miles distant. The disease, in a few days, broke out there also; as no other reason can be given, the belief is that it was conveyed by the men who had been in attendance upon the diseased beasts at Marston. Another case occurred at Dean. Thirty Welsh runts were bought at Leicester fair, and, in a week after, fell with the disease, the last news I heard was that twenty-five had died. I learn also that others bought at the same fair had fallen and died in various parts of the country. I will only mention one other well-known case, which happened not far from my place. In August last, a large drove of Welsh and Irish beasts were taken to Newport Pagnell fair, several lots were sold, which went into different parts of the country, each lot is known to have infected the respective neighbourhoods to which they were taken. The unsold portion of these same cattle were driven to Barnet fair, and there sold into Hampshire; and I learn from a friend of mine that the whole died on their road home. I have this morning received a letter from Mr. C. S. Read, M.P., part of which I will read:

Honingham Thorpe, Norwich, Nov. 4, 1885.

My Dear Sir,—As the report of the Royal Committee has not yet, I believe, been presented to the Government, I do not wish to give my *opinion* as to the origin and nature of the disease, or suggest any measures for preventing its further spread. I will therefore confine my observations to a short record of the outbreak of the cattle plague in Norfolk. In the first week of July the plague broke out in three distinct and separate localities, which may be called Reepham, North Walsham, and Harleston. Certainly in the same week, and I believe on almost the same day, the plague appeared in these three districts, and all could be traced to foreign cattle, which were bought in the Metropolitan Market, and sent into Norfolk. From ignorance, carelessness, and selfishness, the disease spread like wild-fire, till the formation of the Cattle Plague Association for Norfolk; and the injunction on its members to refrain from purchasing stock in any markets for a period of six weeks, had a marked effect. However, the markets were not closed entirely against stock, and certain persons (not members of the association) purchased cattle, and several of them incurred most serious losses. Farmers removed bringing cattle on the 23rd of September, and it is easy to trace the loss of 200 head of stock to the purchases of that day. I mean, of course, the cattle actually bought on that Saturday, and the cattle they infected on different farms. The losses are now becoming most serious, and there is no doubt that the disease is spreading in Norfolk to an alarming extent. The markets are now entirely closed throughout the county, yet dealers continue to congregate cattle and

hold sales just outside the walls of the city or town, and so little good has yet been realised. Everyone no doubt has heard of Mr. R. J. Harvey's most serious loss of cattle at Crown Point. When the cattle began to die, the sheep appeared to be also smitten with the plague, and I believe Mr. Harvey in six weeks lost 1,200 sheep. A lot of healthy hoggies were placed with a portion of Mr. Harvey's sheep, on some fresh ground, and three or four of those are dead, and two out of three that were placed with some sick bullocks, on another farm, have also taken the plague and died, as well as a goat, which ran about with the stock there.

CLARE BEWELL READ.

Since I have been in the hotel to-day, I have received a letter from a friend of mine—a gentleman who went to Hungary some years ago, to manage the vast estates of Prince Esterhazy. As I have not had time to peruse this letter, I have put it into the hands of my brother, who will, with the permission of the chairman, read it to you.

Mr. JAMES HOWARD here read the letter, as follows:

Deutsch-Kreutz, Hungary, Nov. 2, 1885.

Dear Sir,—To attempt a description of the cattle plague, after the elaborate communications which have been laid before the public by Professor Simonda, would occupy much time, without throwing more light on the subject than has been already obtained from the able description of the Professor. There cannot exist a doubt as to the disease being, in the highest possible degree, infectious, and so extremely difficult of cure that hitherto, in this country, not only have the majority of cases proved fatal, but there have been many instances also in which from a whole stable of horned-cattle scarcely one has been saved. Under these circumstances, it is evident that the proprietors of horned-cattle will have to rely much more on the possibility of preventing the spreading of this disease, than on the problematical chances of effecting its cure; indeed, the question may very possibly arise, seeing the great risk that is run of the disease being rapidly propagated by the infection constantly emanating from the sick animals, whether it may not be advantageous, even in a pecuniary point of view, as it is in a sanitary point of view, to have each animal in which the disease distinctly shows itself destroyed at once, and thus diminish, to a great extent, the source from which the infection arises. Should the steam-bath treatment described by an Englishman residing in Russia, and transmitted by him through the Russian Embassy to England, reduce the losses in England, as it is reported to have done in Russia, to 6 per cent., or thereabouts, the solution of the above question would be, and that deservedly, in favour of attempting the cure. Whatever measures may be adopted as regards those animals already affected with the disease, whether in the absence of a more successful mode of treatment than has hitherto prevailed, they be destroyed at once, or whether under a more successful mode of treatment the risk incurred in retaining them to attempt their cure would be more than counterbalanced by the results obtained, it will nevertheless remain a point of the highest importance to cattle-proprietors to ascertain and adopt those measures by which the propagation of this fearful disease may be confined within the narrowest possible bounds. To effect this it is, amongst other things, absolutely necessary that not only a thorough separation of the diseased and even of the suspected animals from those that are still healthy be effected, but at the same time this separation must extend also to the servants employed to tend the said cattle, as it is well known that a servant going from a stable of diseased animals to a stable of perfectly healthy ones will be almost sure to convey the infection to the healthy animals: there have been only too-frequent proofs of this fact. On the other hand, we have also had repeated proof of the safety that has been derived from entire isolation of animals and servants. For instance, it has frequently happened that a large cattle-proprietor, on the approach of the disease, has closed his cattle-stalls, or rather the farm-yards in which they have been situated, permitting neither egress nor ingress of either person or animal; the animals being fed from fodder in the lofts above their stables, and the servants having their food handed to them through a window, thus cutting off all communication from without. This plan has been attended with success, even where the disease has been ravaging the whole neighbourhood around the yard thus isolated; but it must be strictly carried out. For cattle that are lying in fields of pasture, it would be well, on the approach of the disease, to fix stakes in the ground, at sufficient distances, so that one animal might be tethered to each stake, and thus each be kept at a sufficient distance from either of the others. By this means, also, the chances of the disease being propagated are much less than when the whole herd can huddle themselves together in one part of the field, as they generally do if left at liberty. In regard to the means of cure which have been adopted here, it



can merely be said that little good effect has hitherto been derived, consequently little reliance is placed in them. The cattle-proprietors here generally destroy those decidedly affected with the disease; separate those which, from their contiguity to the sick animals, are likely to have caught the infection, and either kill them at once, or immediately on one or two of them showing symptoms of the disease coming on, namely, before the meat has become unfit for food. By this means they are enabled to make something of them, and at the same time not unfrequently prevent the disease extending beyond their own animals. GEORGE B. SMALLBONES.

Mr. J. Howard added that Mr. Smallbones had had the management, he would not venture to say of how many hundred thousands of acres belonging to Prince Esterhazy, for a period of twenty years past.

Mr. C. HOWARD: I have also received a letter from Mr. Spooner since I have been here, together with one from Egypt. From the latter I find that the symptoms of the disease are different in Egypt from what they are in this country. My brother will be good enough to read the letter.

Mr. J. HOWARD: The gentleman who writes this letter is the manager of the Peninsular and Oriental Company's farms. He says:

Peninsular and Oriental Steam Navigation Company,  
Cairo, Oct. 25th, 1865.

My Dear Sir,—I have the pleasure to acknowledge receipt of your letter of the 10th instant to hand to-day. The Egyptian cattle-plague appears fresh in your memory. I have been trying to forget it, for I suffered rather heavily. The following are the symptoms noticed by me: The cattle fastened up at night all right; found in the morning the provender had scarcely been touched, and the animals watering at the eyes and nose, the discharge gradually becoming thick and glutinous, and the white of the eyes turning to a deep red. The animals appeared very heavy, hanging their heads, and in a short time became quite prostrate, like a person in fever; and suffered at last with purging, which in a few hours carried them off. I had several opened, and found the gall bladder very much enlarged, and filled with very thin yellow matter, but could not discover any other part diseased. The change of air to Suez had not the desired effect, for all the oxen I sent there died. I dare say you remember a piece of berseem\*, near the well on the farm. I put an ox at the one end, and a cow that was supplying our little ones with milk at the other. The ox died, after being out about four nights and days; but the cow escaped, and is still living. She is the only one I saved. It is the opinion of many of us Egyptians that the cattle disease, as also the cholera, travels in the air. Possibly you English folk may be of a different opinion. I sincerely hope that the precautions you are taking in England will be the means of staying the dreadful plague. ROBT. AIZ.

A great deal has been made, by those who hold to the epidemic theory, of the fact of the disease breaking out among the dairy cows of London. If these cow-sheds had bred the disease, as suggested by them, it is strange that it had not broken out before, for the same causes have been at work for generations; but, unfortunately for this argument, the disease made its appearance first in those cow-sheds contiguous to the Metropolitan Cattle Market; while those in the City, equally insalubrious, I learn, have all along been free from it. It is not difficult to understand why these cows in the London dairies should have been among its first victims: their unnatural diet, together with confinement in a vitiated atmosphere, would naturally weaken their constitutions, thereby rendering them, as unhealthy dwellings and privations do the human family, more susceptible to disease. I now come to a more important part of my subject—the curative, remedial, or preventive measures. First, then, as to the curative: Much has been said and written upon the modes of cure: again the press and the public were somewhat hard upon the veterinary profession, so far as I understand the position taken by these gentlemen, it is this—

\* Berseem is Arable for clover.

that the disease lies in the system without any symptoms being manifest so long that when the animal does fall the chances of cure are so small, and the danger to surrounding herds so great, that the most prudent, the most politic course is to slaughter the animal, and thus prevent the spread of the malady, the chances appear to be that in attempting to cure one animal risk is incurred, by keeping it alive, of spreading it to a hundred others. From what has come under my own observation, it appears to me that until some remedy is discovered upon which the farmer may undoubtedly rely, the cause thus advocated is the best for the cattle-owner to pursue, had the animals to which I allude been promptly slaughtered on the first indication of the disease, instead of curative measures being attempted, the total loss would have been considerably less. A highly respectable veterinary surgeon of many years' standing in my locality thinks with the much-abused professors that the pole-axe is the best remedy. We must not forget that were these gentlemen to pursue a contrary course, they might run up a long bill against their clients: their practice has at least the merit of disinterestedness. Like all other diseases, the chances of recovery depend upon the intensity of the attack, at best, however, they are but few; for from a report which has been recently published of the number of animals that have been attacked, I find that only from 4 to 5 per cent. have survived. It appears that the veterinary professors who advocate the immediate slaughter are backed-up in their view by the most eminent veterinary surgeons on the Continent, these gentlemen have had far more experience and more abundant opportunities of studying the various forms and stages of the disease than our English members of the profession. It will be remembered that when in 1863 the small-pox broke out among the sheep in the south-west of England, it was exterminated in less than a month by the slaughter of very few flocks. Having said thus much respecting the veterinary profession, there is one point to which they might probably have given more attention, I allude to premonitory symptoms. If correctly informed, I believe the profession maintain that no premonitory symptoms are to be discovered until the animals hopelessly fall, a view which appears to me and other non-professional people most inexplicable and exceptional. Perhaps I might be allowed most respectfully to urge upon the profession that every scientific and other appliance should be resorted to in order to discover whether there are not some slight symptoms not hitherto noticed in the early stages of the disease. This is my only hope, that this at present mysterious malady may be successfully treated. A non-professional friend of mine, who has had many opportunities of observing infected cattle, informs me that he has noticed that for days before the animal falls the breathing is first uneasy, and subsequently more laboured: the breath of the animal is also offensive. The outbreak of the cattle plague has brought out a host of quacks, eager to reap a harvest out of the misfortunes of others. Pamphlets and advertisements are abundantly circulated, the vinegar dealer maintains that bathing the animal with that liquid is a *certain* cure; others interested in the sale of gypsum, carbolic acid, and other articles publish statements urging their preventive properties, and so on, down to the more humble country farrier who perhaps may head his advertisement, "No cure, no pay." The homeopathic treatment has been brought forward, and claims its share of public attention. Since preparing my paper, I find that the editor of *Bell's Messenger* has given a very favourable mention of the doings and pamphlets

of a homœopathic practitioner (Mr. Moore). No names are, however, given of the owners of animals which are said to have been so successfully treated. I do not think the farmers of England have much faith in the globule theory; and it will require something more than the assurances of the worthy editor of Mr. Moore's respectability to convince them that infinitesimal practice is right, either in diet or physic. According to Professor Gamgee, no medical treatment can be said to have been successful; for as large a proportion of animals have got well without any treatment, as those upon which the doctors and others had tried their remedies. The practice adopted of wrapping round the bodies of diseased animals blankets or woollen cloths appears to be a sensible one, and has, we are assured by General Cotton and others, been found of service. So many plans have been recommended, that, were I to go into this part of the subject, my paper would be of undue length. I see in this morning's papers, however, some very important statements were made at Norwich on Saturday last by Lord Bury. It appears that some 4,700 cases of rinderpest have been treated in Holland: 45 per cent. had been saved through the means of homœopathic and allopathic treatment, the homœopathic treatment having proved, according to this authority, the most successful; but as the inquiry to which the noble lord alludes was set on foot by homœopathic practitioners, due allowance must be made for the proclivities of the gentlemen sent over. Before leaving this part of my subject, I should wish to make one or two remarks, which will not, I think, be considered out of place. There has existed a feeling, for years past, that the veterinary art has not made the same progress as other sciences, this to the farmers of England, with their more valuable and increasing flocks and herds, is an important question; I believe by gentlemen holding the highest position in the profession this evil has been felt. So long, however, as farmers prefer the services of uneducated and ignorant farriers, upon the mistaken notion of cheapness, to the services of properly-educated and intelligent veterinary surgeons, it cannot be expected that any great improvement will take place in the style of men practising the veterinary art. I compare the present state of things in many districts to what our forefathers did in going to the barber to be bled, instead of going, as we do in the present day, to the medical practitioner for advice. When more enlightened views prevail with respect to the veterinary profession, and when it takes a position, as I think it ought, equal in respectability, or caste, or whatever you like to call it, to other professions, then it may fairly be expected that young men of intelligence and education will turn their attention to the study of the diseases of our domestic animals. I now come to the last and by far the most important part of my subject—the remedial or preventive measures. The old adage of "Prevention is better than cure" was never more fitting than in the present case. The farmers themselves can do much in preventing this fearful disease from spreading and taking a permanent home in this country, first in cheerfully acquiescing in the course recommended, of abstaining from all dealing and traffic in cattle for a given period (to this I will shortly further allude). The grazing of cattle on roadsides should be imperatively forbidden; animals should be supplied with generous food and pure water. If half-starved animals—of which, I am sorry to say, there are a large number still to be found in England—are left to shiver under hedges, or at best racked up with straw in cold, comfortless yards, the owners must not expect, when danger approaches, to escape the con-

tagion. All buildings should be kept clean, well ventilated, and occasionally limewashed; or perhaps, what is better still, chloride of lime or other disinfectants should be freely used. It has been said, but with what truth I cannot say, that one of the best disinfectant modes is that of tarring the noses of the animals every day. This plan has been put forth by men of experience on the Continent; and as it is inexpensive, and as no harm could result from its adoption, I have singled it out as one of the most feasible modes I have met with. When an animal is attacked and it is resolved to attempt a cure, the early and perfect isolation is a matter of the first importance. Having hinted at what owners themselves may do, I now come to a more important question to the farmers of England, viz., what steps should be adopted by Government in this and any future outbreak to extirpate and prevent the disease spreading. It is true we are indebted to the Continent for a large supply of cattle and sheep, and no thoughtful man now-a-days would wish to interfere with the free importation of food for our population: at the same time, we as farmers have a right to demand from the Government such precautionary measures as will ensure the most valuable animals in the known world from falling victims to diseases introduced by foreign importations. During the last twenty or twenty-five years the British farmer has suffered frightful losses in his cattle, from diseases that were previously unknown in this country: it has been stated, with what truth I cannot say, that these diseases have destroyed more animal food than has been imported during the period named; but certain it is, that our own herds would have been far more numerous, and consequently our own means of feeding the people far greater, had these diseases been kept out of the country. In 1857, our Government was fearful lest the rinderpest, which was raging on the Continent, should be introduced here, Professor Simonds was sent there by the agricultural societies of the three kingdoms, on a mission of inquiry; luckily, we at that time escaped the expected visitation. As the introduction of the disease was at any time possible, I consider that the Government should have insisted upon a thorough inspection, and not allowed it to remain a mere farce as it has been, the idea of one man having to examine some six animals a minute, or nearly as fast as we should count them, and this perhaps in the night, is simply ridiculous. To make the inspection thorough, a larger number of inspectors must be appointed, should the country object to this course on the score of expense, let the owners of the animals pay a small fee per head for the veterinary certificate; the most rampant free-trader could not, I imagine, object to this very small piece of "protection." Had such an inspection as I advocate been adopted, England might probably have been spared the present outbreak; and here I would state that it would be well for us to take a leaf out of the foreigner's book, I would call your attention to the following fact: I have on several occasions had to send Short-horn bulls to the Continent; before shipping them I have been required to sign a certificate and get it counter-signed by the local authorities, that no infectious disease had been prevalent in my neighbourhood for the previous six or twelve months. Russia requires this condition, and yet England interposes scarcely an obstacle to the introduction of her poisonous distempers into these islands. I believe, however, the Government is waking up; for I learn from Professor Simonds that the examination of imported cattle is in a more satisfactory state. Whitehall has issued its Orders in Council, and

although some of these have not been altogether satisfactory, they evince a desire on the part of the Government to arrest the progress of the disease. Here I would observe that when further legislation is attempted upon the cattle question, I trust the Government will not be thwarted and opposed as it was the Session before last upon the "Cattle Prevention Diseases Bill." I could not join many of my friends in their opposition to this bill: it contained many good clauses, and had it been carried it would now have been found most beneficial; I learn that it was abandoned by the Government, not altogether by the opposition it met with here, but through that of the Irish members, who thought it would damage their export trade; the Irish breeders, be it remembered, were the very first to call out when they saw danger at their own doors; and who, through their impertinence, have induced the Government—and, as I think, properly—to stop the importation of cattle into their island. To revert to the Orders in Council: The stoppage of fairs and markets is a step in the right direction. The order should, however, have been peremptory, and not left to the discretion of the local authorities, as a partial stoppage was useless. I firmly believe that had farmers ceased from purchasing at fairs and markets when the plague first broke out, we should now have known but little about it. Some inconvenience will be caused by this regulation, but one good will perhaps result from it: farmers will have to do more business with each other, and less with the middle-man, who of late years has not only fixed the price of the stock, but has had the lion's share of the profits. Very little good, however, will attend the stoppage of fairs and markets so long as men can purchase animals from infected districts and drive them when and where they please—so long, also, as butchers and others can attend the Metropolitan market and send the animals alive from there into the country. The Order in Council states that no animal shall be brought to this market unless for immediate slaughtering, in my opinion it should also have stated that it should not leave London alive. This leads me to another point; should England continue to be visited with plague among her cattle, the establishment of markets for foreign animals at the various ports of debarkation is worthy of consideration; or, perhaps, what would be better still, the erection of abattoirs at the several ports, the animals could be slaughtered and sent to the various dead-meat markets of the country. Old Smithfield will require something to fill it, and I do not know to what better purpose the Corporation of London could put it. I am aware it will be said that this course would entail loss upon the foreigner, it might do to a small extent; but when really so much is at stake—the welfare, I may say the very life, of the seven or eight millions of cattle of these islands—this ought not to be considered; we are bound, the good Book says, "to care first for those of our own household." Memorials have been sent from some parts of the country to the Home Secretary, requesting that measures may be taken to stop the importation of foreign cattle and sheep for the next six months, each, in the opinion of the memorialists, being the only means of eradicating the plague. The resolution adopted by the committee of the Newcastle Farmers' Club is as follows:—"That this Committee petition the Home Secretary to take measures to stop the importation of foreign cattle and sheep for the next six months, each being, in their opinion, the only means of eradicating the rinderpest from this country; and, also, that in their opinion every facility should be given for the importation of dead meat, so as not to interfere with

the supply of the food of the people"—a course not likely to be adopted, and, looking to the millions of consumers, it is one in which I cannot concur. That part of the Order in Council relating to the appointment of inspectors and the power given to them, is open to great objection, and is of a very arbitrary nature. If the appointments were given to none but skilful men, there would not be much injury done; but where unskilful men are appointed, "vested with a little brief authority," we cannot but think great losses have been entailed upon private individuals, by the unnecessary slaughter of a large number of animals. If Government intends to compensate the owners of cattle for such slaughter, there will not be so much to complain of, except the loss to the nation. I am not surprised to find that there is a very strong opinion in many parts of the country, that it would only be a matter of justice on the part of the Government that where animals have been slaughtered by orders of their inspectors some compensation should be made. This view was strongly urged by Lord Winchilesea, in a forcible letter to the *Times*, on October 20th. Others go further, and consider that compensation should be made to all who have suffered any loss by the plague. This view of the question is so well put by the committee of the "Newark Cattle Plague Compensation Association," in an address to the Privy Council, that I will quote their words: "The committee respectfully would submit to your lordships that inasmuch as the owners of English cattle in this country have been in no wise instrumental in introducing this disease, it appears to the committee to press with peculiar hardship upon the English cattle-owner, if he has to bear the entire loss caused by the introduction of a foreign disease, consequent upon the importation of foreign cattle for the benefit of the community at large; that the subject should be treated, as it is in fact, as a national question; and that those who have suffered any loss, by reason of the plague, should be deemed equitably entitled to some remuneration from the national exchequer." I do not know what Mr. Gladstone will say to this, who, I hope, entertains a more kindly feeling towards the agricultural interest than some are disposed to give him credit for. It would, however, be well to remind him of what all men in office like—a precedent. The Orders in Council during the last century provided that a measure of compensation should be made to all those whose animals were destroyed in conformity with the regulations then issued. Whether or not the country will listen to the suggestion, one thing is certain, the farmers cannot be twitted with having done nothing to help themselves, praiseworthy efforts have been made in most counties, by owners of stock banding themselves together to indemnify each other against apprehended losses. It appears, however, from enquiries I have made upon the subject, that with two exceptions only, viz., Banbury and Hertford, these associations have not been formed upon a legal basis: this is an important matter, Mr. Tidd Pratt, an eminent authority upon such matters, informs me that to render any assurance association legal, it must be registered under the Joint Stock Companies' Act of 1862; and unless this is done, proceedings cannot be taken against members for the recovery of the amounts due from them; and what is perhaps of more importance, there is no limit to the liability incurred by individual members. The principles upon which these associations are established are as numerous almost as the counties in which they are in action, if they are to gain a permanent and successful footing, it strikes me they must, like fire insurance offices, be few in number, and embrace all diseases. Having

touched upon these various points, there is one other to which I would invite your particular attention. The question of effectually dealing with the cattle plague, without resorting to such rigid measures as would paralyse the whole cattle trade of the country, has had my best and serious consideration. I have come to the conclusion that a simple plan might be adopted which would soon put an end to the malady. In the first place stop all fairs and markets for a given time, except for the sale of fat stock, due precautionary measures being adopted to prevent such animals leaving any town or place until slaughtered. It should be ordered, that in any village or township where the disease should break out, an inventory of all cattle be at once taken; that none should be allowed to pass through or out of that village or township, or perhaps the adjoining one as well, so long as there was any case in it, and for three weeks after, and that a heavy penalty be inflicted for a breach of this law. I think the police might be employed in this service (unless their new duties of looking after the poachers would prevent them), that the veterinary inspectors should see all cattle weekly according to the inventory, and that no animal should be buried or otherwise made away with, without a certificate from the inspector. If this regulation were to be put into practice, it would be at once ascertained where diseased beasts were to be found; the murrain would soon be narrowed in its limits, and very soon effectually stamped out, and this without the enormous inconvenience to farmers and others by the adoption of more rigid measures. In a highly interesting pamphlet, written by the late M. Renault, and published recently under the authority of the French Government, I find that similar, only more despotic, steps have been adopted by Austria and Prussia for some years past on their eastern frontier; and, at the present moment, France, by its prefects, is enforcing even more rigorous measures. I quote also from Lord Bury again, who says: "That on the appearance of the disease, the Dutch Government immediately drew a sanitary cordon for a considerable distance around the locality. Agents and sentries were appointed to watch all the roads and to prevent any movement of stock outside the infested district, which contains about 250 square miles. The success of this step had been established by the fact that while within it about 5,000 cases of the rinderpest had occurred, outside of it there had been only three cases." Gentlemen, I now leave the matter in your hands, feeling assured that your time will be well occupied in discussing a subject which so much affects not only the farmers, but the masses of this great country. For we cannot disguise the fact that, should the cattle plague continue to increase, as from the late returns appears to be the case, meat will advance to such a price, that it will be beyond the reach of thousands who have hitherto enjoyed this luxury. Such is the state of things in countries where its ravages have been severe. My brother (Mr. James Howard) informs me that when he was in Cairo last spring, beef was from 2s. 6d. to 3s. per lb. I earnestly hope that such measures will be taken as will prevent any such calamity befalling our highly-favoured land. (Cheers.)

Mr. W. J. BROWN (Hazlebury, Box, Chippenham), said as a humble member of that Club he felt very grateful to Mr. Howard for introducing that subject, which was one of the utmost importance to the country as well as to agriculturists. He was thankful to say that as an individual he had not suffered at all from the cattle plague; but it had lately appeared in his district, within about ten miles from his farm, and he felt as certain that it was introduced there by foreign beasts as that he was alive at that moment. The first case of which he would

speak occurred at Kingswood, in the neighbourhood of Bristol. Nothing was there known of the disease till some foreign beasts passed through the village. A small herd of six beasts was afterwards attacked, and they were all killed directly. There were four more foreign beasts which were purchased in the Bristol market, whither they had travelled from London. After being purchased they passed through a healthy district, and nothing appeared to be the matter until they had reached the premises of the purchaser, Mr. Wyatt, a butcher and farmer of Beach. Within a very short time, Mr. Matthews, a neighbour of his, saw that one of these animals was unwell, which was taken away in a cart, the other three driven at the same time. Mr. Matthews' farm adjoined Mr. Wyatt's, and to his sorrow Mr. Matthews discovered early in October that one of his twelve calves was attacked; all died in about fourteen days, the second calf that took the disease living the longest. Immediately the calves were dead, the disease broke out amongst twenty-four dairy cows and eight grazing beasts. Twenty-five of these animals were dead, and it was expected that the remainder would have to be killed in the early part of this week. Mr. Matthews had some beasts in another part of his farm which were as yet well. Another neighbour of his, Mr. Moses Gibbs, had eighteen cattle—viz., five cows, eight steers and heifers, and five yearlings; and they, too, had suffered from the same cause. The first symptom which he observed appeared on the 23rd of October; he then perceived a stiffness in his heifers; and for three days he treated them for influenza. The inspectors saw them, and condemned them, and within eight days of the commencement of the attack the whole herd was gone: seven being buried and eleven killed. The disease next appeared at a distance of about a mile, on the farm of Mr. John Gibbs, a brother of Mr. Moses Gibbs. The result was that a herd of twelve steers was ordered to be killed, and that order was carried out. The next case was that of Mrs. Truebody, who had fourteen cows. Up to Saturday one was killed and buried; another was ill on Saturday night. The disease, he might remark, seemed to go in a straight line from east to west. Mr. Highnam, of Dyrham, bought at Kingsdown fair ninety ewes, which were brought home. Twenty were taken out and put with his usual flock, and all up to the present time were well. Of the remaining seventy, thirty-four were dead up to last night, and the symptoms were exactly the same as those in the beasts. He could not account in any way for the fact of the sheep having thus suffered; but he repeated that he had no doubt whatever that the cattle got the disease from the foreign animals which were brought into the district.

Alderman MECHT wished to state one or two facts connected with his own district that tended to confirm what had been said as to the disease being spread from the Metropolitan market. In one case some cattle which were brought from London to Kelvedon were put on Mr. Revel's farm, *in transitu*, as it were, to another farm; and the consequence was that all the cows on the farm died, or had to be slaughtered. A number of cows in an adjoining meadow caught the disease from those cows, and there were other cases in which animals were lost through the introduction of cattle from the London market. Fortunately his own cattle, and that of some of his neighbours, had escaped; but he believed that was because they had not bought any new stock. So far as he could judge, the disease was spread by contagion. They had, indeed, had an unusually hot summer, and there was an extraordinary amount of effluvia from the animals which were shut up. Disease was no doubt floating about in the air, and that perhaps produced a tendency to disease in cattle, as well as in the human subject; but his observations in his own neighbour-

hood had led him to believe that it was by contagion that the cattle-disease was propagated. When contact was done away with, there was no case of disease; and he had heard of no case of disease within five or six miles of his farm for the last three or four weeks.

Mr. JOSEPH MARTIN (Littleport, Ely) said he believed that those who were at all acquainted with this disease had arrived at the conclusion that it was contagious. When it first broke out in his own immediate neighbourhood they could trace it to calves brought from London, and the result was that from forty to fifty animals were lost in the parish of Mepal. Within the last three days the plague had broken out at Ely. The owner of these animals had weaned, if not bred them; they had always been in his possession, and were quite isolated in situation. At the time they were attacked they were all tied up in a lodge, and two were taken at the same time without any clue to the way in which they were infected.

A MEMBER: How far were they from the road?

Mr. MARTIN: Some distance from the turnpike-road.

Mr. CHARLES HOWARD: Did the same men attend them that attended the others?

Mr. MARTIN: No. This disease visited our country about a hundred years ago, and it was found so highly contagious that the government adopted very stringent measures with regard to the men who attended upon animals. Such persons were obliged to have their hair tied up in bags, it being thought that the disease was conveyed in the hair, the clothes and shoes. At that period, all the fat cattle in Lincolnshire being dead, some butchers crossed into Yorkshire to purchase beef; and in every yard they entered the disease appeared. The Government had issued orders with regard to fairs: but what did the dealers do? They offered animals for sale upon bye roads and private property, to evade the order in Council. He was glad to find an order had been issued to prevent such occurrences, though it was like shutting the stable door when the horse was gone. If he were Chancellor of the Exchequer he would place a tax on cattle dealers, which would tend to check that evil (laughter). He had noticed that wherever there was a fair, directly after they could trace the rinderpest. Take the case of Leicestershire. There was no disease whatever there till the fair was held: now it had broken out. It was the same in regard to Peterborough. There also there was no disease till after the fair; but it was now raging most virulently. Now, with regard to sheep, it had been stated by Professor Simonds that Mr. Harvey's sheep had the plague. He (Mr. Martin) did not see those sheep, and he knew nothing about the matter himself; but he had heard other gentlemen express a different opinion from that of the Professor. He should be happy to hear the Professor's opinion on that subject; and he should be glad if he would state why the sheep that were confined with the bullocks that had the disease did not also take it. As to curative measures, he was convinced that if they were to make an analysis of the cases of animals which had been treated and cured, it would not speak very favourably for the veterinary profession. From the returns that had been made, it appeared that only one-half per cent. had been cured; but he would assume the proportion to be four or five per cent. It was acknowledged that a large number of the animals which had been treated and had recovered would probably have recovered if they had not been treated; and the proportion cured in consequence of treatment must perhaps be reduced to two per cent. Was it not, then, the best course, when such a contagious disease appeared on a farm, to have the animals killed at once? (Hear, hear).

Mr. LEE STERR (Jayes Park, Dorking), said he regretted that a meeting of the club for the consideration of that im-

portant subject had not been convened before, because he thought the farmers, represented as they were by themselves that evening, had not had fair play (Hear, hear). They had seen in the papers, day after day, different views expressed on this question, some writers abusing the veterinary profession and some the Government for this thing and that; but the farmers themselves had never as a body properly spoken out. He should himself deal with the subject by asking questions with a view to obtaining information. He should like to know, in the first place, whether the meeting did or did not consider that this plague had been imported from foreign lands? His own opinion was that that certainly was the case, and he thought the plague would continue as long as cattle were imported from abroad in the free sort of way that they were, without any possibility of a proper inspection: especially as it was the opinion of Professor Simonds and other great veterinary authorities that an animal might have come in contact with the plague on the other side of the water, might be five days coming over, might pass the inspectors, might go to the Metropolitan market, and might actually go into the country and pass the inspectors there before the disease broke out. He really did not see how they were to guard against the disease being imported into this country, so long as the importation of foreign cattle was allowed (Hear, hear). He was not going to advocate at that moment the stopping of the importation of foreign cattle, for he could not understand how our population was to be fed without it; but he would not say that it would not come to that. Violent diseases, it was said, required violent remedies; and if this evil continued in its present dreadful form, he really believed the Government would have to step in and prevent the importation of any foreign cattle. There were many persons who would have it that this disease was not imported from abroad, but had sprung up among the dairy establishments of London. He should like to know whether that was the opinion of the meeting. He should also be glad to learn what was their opinion as to the course which the Government had pursued in ordering their cattle to be destroyed on the word of an inspector, without giving them a guarantee that they were to be remunerated for their loss (Hear, hear). He wished to know what was the view taken by a large assemblage of farmers coming from all parts of England on that important point. His own opinion was that it was a most unheard of thing in this free country for the Government to order men's cattle to be destroyed without offering them any remuneration (Hear, hear). Such a course was perfectly un-English (cheers). Indeed, he must say that the conduct of the Government altogether in this matter seemed to be open to great doubt. They had read in the papers that one of Her Majesty's ministers, when he got up at a large gathering in Yorkshire to return thanks for his health being drunk, said, in effect, "I suppose, gentlemen, I must allude at this meeting to this cattle plague, which is going on in the country; I consider that and the Fenian disturbance in Ireland to be both of the same calibre." When such language was used by Sir Charles Wood, a cabinet minister, what confidence could the farmers of England have in the Government in reference to this question (Hear, hear)? The gentleman who had introduced the subject went so fully into it that he had in fact left but little to be added. They must all feel that without stringent measures, such as the stopping of the fairs and markets, which ought to be done through a general order of the Government, and not left to magistrates at the different petty sessions, the disease was likely to assume a still more formidable character; and even a penalty of £20 would not alone be sufficient to prevent the

spread of the malady. As regarded the question of treatment or cure when the disease had broken out, he could not doubt which course was preferable when he saw such men as Professors Simonds, Gamgee, and Budd advocating the use of the knife in preference to tampering with the disease and trying to cure it, especially as farmers generally had not sufficient conveniences for the separation of animals. Farmers, like other classes of society, would rather pay small bills than large ones, unless there were some evident advantage connected with a large outlay; and considering what experience had been gained on this subject, it was not surprising that they did not incur the cost of resorting to a first-rate veterinary surgeon, when subjected to the ravages of the cattle plague (Hear, hear).

Mr. J. N. LEE (London), said he should not have intruded on the attention of the meeting for a moment, had not reference been made by Mr. Howard to a paper with which he was connected (*Bell's Weekly Messenger*). A gentleman who had just sat down asked the important question whether they believed the disease to be capable of cure or not; while another gentleman stated that the cases of cure had only been from 2 to 4 per cent. It having been affirmed that Mr. Moore, a homœopathic veterinary surgeon, had successfully treated, either personally or through instructions given by him, a large number of cases, he (Mr. Lee) thought it was nothing but right that the attention of the farmers of the country should be drawn to the subject, so that they might, by a careful consideration of the arguments and facts stated by Mr. Moore, form some idea as to whether the disease could or could not be cured. Mr. Howard had referred to a statement made by Lord Bury, that only 45 per cent. of the cases which had come under allopathic and homœopathic treatment have been cured.

Mr. HOWARD said he remarked that the homœopaths appeared to have had the best of it; he combined the results of the two modes of treatment.

Mr. LEE continued: If Mr. Howard would refer again to the report of Lord Bury's speech he would find that his lordship stated, on the authority of Dr. Hamilton, that the total per-centage of cures by homœopathic treatment was 75 per cent. Some gentlemen present were, perhaps, not acquainted with the facts mentioned by Lord Bury. Premising that he (Mr. Lee) was neither a homœopath nor an allopath in relation to this matter, it being his duty to place before the farmers of England all the well-authenticated facts which were brought under his notice, and believing they were as capable of drawing right conclusions from those facts as he himself was, he would read the following extract from Lord Bury's speech: "In Sept., when the cattle plague was raging in Holland, two Belgian gentlemen, M. Gandy, a member of the Veterinary College, Brussels, and M. Sentin, a homœopathic chemist, offered to the Dutch Government that if a district were put under their charge, and if they would not allow them to be interfered with, and would not require them to make a report until a sufficient number of cases had been treated, they would on their part give their services gratuitously, and try the system fairly. This was accepted by the Dutch Government, who agreed to give a commune up to the homœopaths, it being understood that the veterinary surgeon of that commune should be required to certify that every case which came under homœopathic treatment was an actual case of rinderpest. Matterness, the district assigned to the homœopaths, was a commune situated in the very centre of the infected district. The peasants and proprietors were somewhat prejudiced against the homœopathic system in the first instance, and did not enter cordially into the view of the homœopaths, but be-

fore the termination of the experiment they were greatly pleased with it, and gave every assistance in their power. At the commencement of the experiment the proportion of cures effected out of the animals attacked was 70 per cent., but in the last three weeks the homœopaths saved nine out of every ten cattle which came under their treatment. Matterness was situated within a mile of Kethel, in the very centre of what had come to be styled the "black district," so that the homœopaths did not enter upon their tasks under peculiarly favourable circumstances. They continued it till September 22, and 80 beasts came under their care, each case being certified by the veterinary surgeon as one of actual rinderpest. Of these 80 animals 60 recovered and 20 died. Besides these, 230 beasts in the commune were put under prophylactic homœopathic treatment; 25 took the disease before the treatment had had time to work, but in the fourth week no fresh cases had occurred, and on the 21st of October the commune was pronounced free from disease, and had remained free from that time to the present. A large proportion of the cattle attacked in the commune of Matterness had been treated by the allopathists before the homœopaths came into the district. In all, 189 cases came under treatment, 80 under the homœopathic system, and 109 under the other. As 73 cures only were effected, of which 60 were attributed in an official report to the homœopaths, the balance was largely in favour of the homœopathic mode of treatment." Now he (Mr. Lee) thought those facts deserved to be brought under the notice of the farmers of England (Hear, hear). An important question arose out of this, namely, whether the Privy Council ought not to communicate with the Dutch Government, with the view of ascertaining whether what was stated by Lord Bury on the authority of Dr. Hamilton was true or not; and if it should turn out to be true, means ought, he thought, to be adopted for trying the effect of the homœopathic system here (Hear, hear). Lord Bury closed his address by saying, "The homœopathic body felt that the statistics which he had quoted were of no use unless they were brought to some practical result, and if a veterinary surgeon were allowed to certify that case each assigned to them was one of rinderpest before they treated it, and if they had a sufficient number of cases to enable them to make a fair average, they would undertake that a competent veterinary surgeon should come to take the cases in hand, and a leading firm of homœopathic chemists had also agreed to give the necessary medicines free of cost." He (Mr. Lee) hoped this proposal would be accepted.

Professor SIMONDS said: In proceeding to make a few observations on what we must all regard as a national calamity, I shall endeavour to be as concise as possible, and to answer, so far as my memory will allow, some of the remarks which have fallen from preceding speakers. First, I will say a word with reference to the origin of this affection. It has been supposed by some to have sprung up spontaneously; but all the evidence which we have in relation to it, all that we know of its history, leads to the conclusion that it has not existed in this country for 120 years. After having taken what is said by those who hold the theory of a spontaneous origin, the theory that this is a disease which arises from ordinary causes, into full consideration, I would ask whether in the last 120 years there has not been sufficient mismanagement of our cattle to have caused the disease to be developed long ago if it could arise simply from spontaneous action or from ordinary influences bearing on the health of animals. With regard to the question how this disease came to appear first in cowsheds in London—a fact which has led to its being attributed to mismanagement of the London cows—I would observe,

that it is an established fact that it was noticed very early in some of the best-managed dairies of the metropolis, while it is also an established fact that it made its appearance in some of the dairy cows in the Metropolitan Market. There is another point which should not be forgotten in considering this question, namely, that of late years the whole of the cow-sheds of London have been under local management. The parish vestries have appointed sanitary inspectors, whose duty it has been to visit the cow-sheds to see that they were properly drained, ventilated, and so on, and not to allow a larger number of animals to be placed in any shed than could be kept there without deteriorating the air. Moreover, these inspectors have always looked tolerably close into such matters, and I believe it may be affirmed that the cows of London were never in a better condition than they were, generally speaking, at the time when this disease first appeared. I now come—for I must be exceedingly brief in my remarks—to the question of the probable origin of this disease in foreign countries. You must bear in mind that this disease belongs to Russia (Hear, hear); it belongs to all the countries lying to the south of Russia; and whenever it has made its way into Austria Proper, or into Hungary, or into Bohemia, or into Galicia, or into Prussia, it has invariably been traced to the introduction of animals from Russia, or from the countries bordering on those I have just mentioned. There is no spontaneous origin of this disease on the Continent of Europe, westward of a line drawn from Memel on the Baltic to Trieste in the Gulf of Venice. There has been no rinderpest in Europe since the last general war, when its presence was to be accounted for by the fact that the armies of Russia and Prussia were compelled to draw their supplies of meat from the countries to which I have alluded. It followed in the wake of those armies and spread all over the Continent; and it was not until after the establishment of peace, when nation after nation saw the vast amount of injury which it had sustained, and that the whole of the cattle was being swept away, that recourse was had to those stringent measures which were then put into operation. By those measures they expelled the disease from their borders; and it was thus put back, as it were, to those countries to which I have alluded, where stringent measures could not be adopted, and which have in consequence become the abiding home of the cattle-pest. Now, it has been said that this is a disease belonging especially to the steppe cattle, that is to say, the cattle nurtured and fed on the vast plains of Moldavia, Wallachia, and Podolia, and that whenever they are removed from those districts to others, it is developed by ordinary causes. Now, to that opinion I certainly take exception, and I do so because I know, from my own investigation of this malady, that it belongs not to the steppe cattle or to any other cattle belonging to those countries; it rather belongs to the whole of the animals existing in those countries, and from time to time, like small-pox in sheep and other special affections, it assumes a more serious character than usual, and spreads over a greater extent of country, and then by means of the ordinary cattle traffic it is carried to other countries. Turning to the facts connected with the appearance of this disease in England, you will recollect that until May, 1865, we never received any animals, either directly or indirectly, from Russia; and I would appeal to any one who is conversant with the matter whether at the time the Russian cattle first arrived in England they were not looked upon by all the cattle dealers as very great novelties in the Metropolitan Market. If any animals did come from Russia before, it was certainly indirectly, not directly; but it is a disputed point whether we ever had any at all before May this year. Now, every one who is acquainted with the sanitary regulations of

the Continent must know that if this disease were to spread from Russia to Prussia, and were to come in the ordinary course of cattle traffic from Prussia to England, it would have to break through no end of cordons. Every man's premises would be surrounded with a cordon; no individual belonging to those premises would be allowed to come out of that cordon, and no stranger would be allowed to enter it. Supposing that diseased cattle were to cross the Prussian frontier and get into one cordon, there would then be another cordon; there would, in fact, be cordon after cordon, and nobody can tell what number of cordons the animals would have to break through, before they could depart from the western side of Prussia. You see, therefore, that there are so many difficulties in the way of our getting this disease overland, that it may well be considered almost impossible that it can have come in that way from the countries to which I have alluded. I wish to lay stress on this point, namely, that although the disease has existed, and exists at this moment in Hungary, it is in such a remote part of that country that Austria herself is not affected by it. I may remark that when I had been visiting Galicia, and afterwards went to Vicenza, I was not permitted to enter the Austrian cattle sheds because I had been in the country of the pest. That shows how stringent are the regulations in Austria, and illustrates the alarm which is felt in other European countries besides our own, while we could not have a better proof of the improbability of our having received the disease overland from the countries which I have mentioned. Well, now, we will go to Russia; and you must bear in mind that there the state of things is totally different from that which I have described. In consequence of representations having been made to certain individuals that animals were to be bought at a very low rate in Esthonia, a person went out on commission to arrange for the purchase of some, and he secured a number which were brought together at Revel. Those animals were put on board a steamer which came down the Baltic; that steamer called at Copenhagen for orders on the 22nd of May, and within six days from the time of its leaving Revel it arrived at Hull. Here, then, was a direct importation in six days from Revel, the first and only one that we ever had. Now, it has been argued with regard to these Russian cattle that they come out of Esthonia, that they were fed there by the barons, and that it is impossible that they can have had the disease; for not only had they been for a long time on the premises of the individual owners, but no disease of this kind existed in Esthonia. The Government has been blamed, and it has been praised. Now, with regard to its being blamed on this question of looking into the condition of the Russian cattle in the first instance. I should say that we questioned the Russian authorities as to the state of health of the animals in Esthonia almost immediately the disease became known in this country. As we anticipated, the reply was that there was no disease there (Hear, hear). It was not at all likely that we should get any other reply (Hear, hear); it was not at all probable that they would say that a disease existed which would interfere with the trade which was likely to spring up with Great Britain (Hear, hear). Now there is another fact connected with these Revel cattle—and in making these remarks, let me say that I do not wish to bear too hard on those cattle: I am only stating facts—there is another fact which has been too much lost sight of, namely, that the contract was for animals which were to have weighed 1,000 lbs. each, live weight. When the animals were brought down to the individual who purchased them, he found that a great number of them did not come up to that weight, and consequently he refused to take them. "Well," said the barons, "if you will not take our cattle, we will go elsewhere.



and see if we cannot get cattle that will make up the weight." They went in search of other animals; they went nobody knows where: it may have been to St. Petersburg or to Wilna; and the result was that a number of fresh cattle were brought down in waggons to Revel. They were four days on the journey to Revel, and were so much knocked about, that, when the man who had engaged to get them shipped saw them, he said, "I cannot take them; they are so much injured that I am afraid they would be altogether unfit for the English market." A dispute having arisen between the parties, two experts were called in, to say whether the shipper was to take any of those cattle; and the result was that he took thirteen of them, which were put on board the vessel with the others, to make up the cargo of 321. Now, without laying too much stress on this matter, I would observe that there is this fact in connection with these Revel cattle, that one of the animals had been so bruised and injured on the journey to Revel that it died in the yard before any of the others were put on board, while another animal was ill on board ship. The illness of the last animal could not be attributed to the voyage, because, if that animal could be struck down by the six days' voyage from Revel to Hull, it would have been the only animal out of 321 which suffered from that cause. We see here something like a special case of disease. That animal required more than ordinary treatment on board, for brandy-and-water and other stimulants were administered to it. Well, these 321 animals arrived in Hull on the 28th of May. Some persons have asked, "How is it, if these animals brought the disease, that it did not break out at Hull?" None of them went into the Hull market—not one of them was purchased there—but some of them were bought by a butcher at Manchester, while others went to Derby and Wakefield to be slaughtered. A number of them were bought by an individual almost immediately after being landed, having been driven to a convenient place, where he could look over them and select such as he required. That individual did not pick out the sick animal which I have mentioned; but it was sent to London, where it arrived on the 29th of May. On reaching London, it went into a layer in Maiden-lane, where it remained until it went with the others into the Metropolitan Market on the 21st of June. Twenty of these animals had been previously picked out and sent down to Portsmouth for the shipping, and the number that went into the metropolitan market was reduced to that extent. Now, in consequence of those animals having been sold in the Metropolitan Market on 21st of June, we could get no subsequent information with regard to them. They were killed directly after being sold, and went to the Whitechapel market, and we could obtain no information as to whether they were then subject to the pest or not. Here, however, we have the simple fact of animals that came from Russia, the home of the pest, arriving in England within six days, before the period of incubation had elapsed, and being sold in our Metropolitan Market within the time of the disease declaring itself. The first thing which we hear of this disease is that it has shown itself in a dairy close to the Metropolitan Market—that it has shown itself in a dairy connected with layers used for English cattle and also for foreign cattle, where it had assumed a very serious form, and that the attention of a veterinary surgeon was directed to it for the first time on the 21st of June. Now I will leave that outbreak, which you all know took place in Mrs. Nicholls' dairy, to advert for a few moments to one which is not so well known that took place at Hackney. Let us examine what was the cause of the Hackney outbreak. The attention of the veterinary surgeon was first drawn to that case on the 28th of June, and the disease was clearly traceable to a cow which was bought in the Metropolitan Market

on the 19th of June. That was not a foreign cow, but an English one. It was sent up from Buckinghamshire by Mr. Bardsley, a large cattle dealer, and bought on the 19th of June by Mr. Baldwin, and it went direct from the Metropolitan Market into Mr. Baldwin's sheds. Within nine days, the ordinary period of incubation, that animal sickened of the disease; it communicated the disease to the rest of the stock, and the whole 22 or 23 were swept off in a very short time. There is another fact connected with these original outbreaks which I think goes a long way to establish the introduction of the disease, namely that another outbreak took place in Whitechapel about the same time. Here is an outbreak at Hackney, another at Islington, and a third at Whitechapel. How did the outbreak at Whitechapel occur? The man who experienced it was not only a cowkeeper but also a cow dealer; and the animals which he bought in the Metropolitan Market were sent to his sheds, remained there till the next market day, and were then sent again to market. That was his custom. There never was a day when he did not buy animals; so that the outbreak in that case was easily enough accounted for. Now I think, then, that if we look at all these isolated outbreaks, one can hardly suppose that this disease had a spontaneous origin, but must come to the conclusion that in each case the same cause was in operation, that cause being that animals were introduced on the several premises which came direct from the Metropolitan Market (Hear, hear). The only thing wanting in the chain is some connecting link between the 1st of June and the 19th of June. We want to know something about the disease at that period, and it is not improbable that the investigations which are now going on will throw light on that point. I hold, however, that it is highly probable that the disease was introduced from Russia, and is not attributable to any other source. In support of this view we have three positive facts: One, that the disease exists in Russia; fact two, that Russian cattle come here; fact three that within nineteen days after they were landed we had the disease spreading from the Metropolitan Market. These are three important facts, and I don't think any one can get rid of them. I now pass on to speak of some of the original outbreaks of this disease in different parts of the country, and not only in this country but also in Holland, which is intimately connected with our own land. This subject was very properly adverted to by the gentleman who read the introductory paper. And here I must say that a more dispassionate view of the question than that which he took I have never met with (cheers); I never heard the subject treated so well by an unprofessional man; and I wish to convey my individual thanks to Mr. Howard for the information which I have derived from his paper. As regards the original outbreaks of this disease in the country, the outbreaks in Norfolk may, as he said, every one of them be traced, directly or indirectly, to the Metropolitan Market. Animals which had been bought in the Metropolitan Market were sold on Norwich Hill, whence they went to Reepham, North Walsham, and other places, and it was by that means that the disease was spread. The case was similar in Kent and in Sussex. I myself investigated several outbreaks in Sussex, and I traced every one of them to calves bought at Chichester, which calves had been sent direct from the Metropolitan Market. We are now engaged in tracing all the original outbreaks. I believe it will turn out that every single case is traceable to the Metropolitan Market. Let me now allude to the Dutch outbreak. It is generally supposed that that outbreak took place in August. The Club will perhaps be somewhat surprised to hear that it actually took place early in July. It took place in this manner: A number of animals

were sent from Kethel by Mr. Defries to his son here for sale in the Metropolitan Market. They went into the market on the 22nd of June, they went there again on the two succeeding days, and they were not sold, there not being sufficient bid for them. The consequence was that Mr. Defries wrote to his father on the subject, and it was decided that the animals should be sent back to Holland, and back they went, leaving England on the 22nd of July. It was absolutely noticed on the wharf that they were ill before they were sent away. It was not known by the inspector what was amiss with them, but they were evidently out of health. They went direct to Rotterdam, and arrived at Kethel, near Schiedam, and within two days after their arrival they began to die of the disease. Twenty-three or twenty-four were sent back, and twenty-one were lost within a week or ten days after their departure from England. They communicated the disease to some cattle belonging to another person which happened to be in the next pasture, being separated only by an ordinary ditch. In this way the disease was introduced into the neighbourhood of Schiedam, and was making great ravages nearly a month before the Dutch Government knew anything about it. The fact is, we had sent the disease to Holland without their being at all aware of the fact, or knowing any more than we had done at the outset what had to be dealt with. Animals were sent from England to Holland after having been exposed to the disease in our market. It has been said that the Dutch cattle got the disease. That is true enough, but they got it because they first received it here. That is the answer to the statement that it was not Hungarian or any other eastern cattle that introduced the disease into this country (Hear, hear). So much then for the origin of this affection. One word with regard to the question of its extent at the present time. I regret to say that, with the exception of three, or at the utmost four, counties, every county in England has the disease (Hear, hear). The only counties which appear from the returns to be free from it are Hereford, Monmouth, Rutland, and Westmoreland; while two-thirds of Scotland appear to be affected to a greater or less extent. You see, then, how wide-spread this affection is, and how necessary it is that stringent measures should be adopted, far more stringent even than those which have been adopted up to the present time (Hear, hear). One word with reference to the course which has been taken by the Government in this matter. It fell to my lot to make the first communication to the Government with respect to this disease. I received information as to the affection on the 4th of July. I went to the dairy of Mrs. Nicholls under the impression that her animals had been poisoned, that being what was told me by the veterinary surgeon in attendance, and by Mrs. Nicholls herself. Investigating the disease on the spot, I saw enough to make me hesitate at once as to whether that was an ordinary case of poison; and before I left the premises my mind was nearly made up that we had a new cattle disease in the country. I did not say to Mrs. Nicholls, nor to the veterinary surgeon in her presence, that I had any doubt as to what was the nature of the affection; but no sooner was I alone with the veterinary surgeon than I said to him (it having been proposed to analyze the animals' water, the contents of the stomach, and so on), that I thought all that would be of no use whatever, because I feared that we had a new disease to deal with. I also said to him that we must try and ascertain whether there were any more cases which resembled that of Mrs. Nicholls's animals, adding, that if I found that there were others I should then feel no doubt on the subject. The next day I ascertained that other cases of disease had begun, and within five days after that I made a communication to the Government. During the five days

which I spent in investigating the disease I drew up a circular, which was sent to every veterinary surgeon, in order to ascertain whether he had had any instance of such an affection; and I got returns from all parts of the country, showing that there was nothing of the kind. You can readily understand that the Government were not very likely to give full credence at once to my statement. The thing came upon them by surprise, and at first they naturally hesitated as to whether they should or should not deal with this affection. Without mentioning names, I may state that when I went to the Government at a former period with regard to the smallpox in sheep, a gentleman whom I saw said to me, "You will excuse my asking you the question, but are you positive in this matter?" and on my replying that I was positive, he shrugged his shoulders and exclaimed, "Would to God that we had some despotic power!" For want of such power the Government could not take the bull by the horns, and they cannot do so at the present time: their hands are tied. When we are told that the Government have taken strong measures, I would remark that they will have to go to Parliament for a bill of indemnity for what they have done (A voice: "They will get it"). It was not till a bill had been passed for the suppression of smallpox in sheep that the Government were able to act energetically in that matter. In the present case they have proceeded cautiously, and perhaps they have done all that, as a constitutional Government, they ought to have done under the circumstances (A voice: "No"). There were more difficulties in the case than many people supposed. It has been asked why the Government had not indemnified the owners of cattle for their losses. Why they have not got a shilling for that purpose (Hear, hear). Again, it has been asked why the Government did not do what was done in 1847. The reply is, that they could not do so (A voice: "Parliament might have been called together"). It is easy to find fault afterwards with what has been done; but whatever may be the individual or the collective opinion of those whom I now address as to the conduct of the Government in this matter, I say—say without fear of contradiction—that the Government has acted nobly considering how its hands have been tied up (cries of "No, no"). I am afraid, Mr. Chairman, that this part of the question might lead me into details which would take me away from what I intended to say, and therefore I will content myself with observing that I believe the Government has acted nobly (renewed expressions of dissent). Now, then, I come to the question of the extension of this disease to other animals. I do so because the question has been put to me whether the disease is capable of being communicated from the ox to other animals, and whether those animals can in reality communicate the disease to others. If the question be whether or not sheep are especially susceptible of this affection, I have no hesitation in saying that they are. Those who know me best as a professional man, and who know what have been my advantages over many others—I take no credit to myself on that account—will, I think, feel that I would not be the first man to hoist the danger-signal, and that if I do hoist it, it is because that is necessary. I have hoisted the danger-signal with regard to sheep. I say that sheep have got the disease, and have got it as thoroughly established in their system as oxen. Mr. Harvey, of Norfolk, had 2,000 sheep at Crown Point. He bought a number of Irish steers at Norwich market, and the cattle and the sheep communicated together, the former having previously become infected with the disease. Within a short time 107 or 110 cattle died. Assuming that the sheep were susceptible of the disease—they were, he might observe, placed under favourable circumstances for its extension—and what is the result? Up

to the present time, out of 2,000 sheep at Crown Point, 1,400 have died; and the very fact that 1,400 sheep out of 2,000 have died in the course of a couple of months ought to be sufficient to convince persons who know anything at all about sheep diseases that this is not an ordinary affection. But I go further; and I say that we have taken the discharges from the eyes and nostrils of Mr. Harvey's sheep, and inoculated sheep in London with the matter, and we have produced the disease in the sheep so inoculated. Again, we can show clearly enough that the sheep were labouring under a contagious disease, and a contagious disease allied to the rinderpest. We have exposed cattle to the same sheep that were inoculated from cattle, and the cattle so exposed have taken the disease from the sheep by ordinary infection. With such facts before you, I do not see how you can doubt that my view of the disease of the sheep is a correct one. The case of Mr. Harvey's sheep is not an isolated one; there is also the case of the Blakeney sheep occurring within a few miles. A number of sheep were bought at Thetford, were sent to Blakeney, and took the disease with them, having been exposed to the infection previously. The disease was communicated to the cattle, and nearly all of them died in a few days. I might mention other cases which have occurred in Norfolk, Suffolk, and Essex. I will give you two in Essex—one being the case of a number of ewes, and the other of a lot of lambs. The ewes were bought in June in two lots—nineteen in one lot and twenty in another, and a more healthy set of ewes a man could not look upon. I saw them again and again, and they seemed exceedingly healthy, and were worth £3 a-piece. The cattle plague, however, was introduced on the farm by some bullocks that were driven. These cattle were put into a field adjoining a field of sheep, the separation being a gate-communication between the fields and a low hedge. The result was that the disease spread from the cattle to the sheep, and at the date of the last report out of 90 ewes 48 had died. The ewes were well managed. Two rams were put with them, and one of these also died. The other case was that of 147 lambs bought at Colchester. The disease manifested itself in them, and spread to the cattle on the same farm; and a great part of the cattle are now dead. Here, then, we have a free interchange of the disease between cattle and sheep, as the result of exposure and inoculation (Hear, hear). One word more with reference to treatment. I am one of those who from the beginning have never felt any great confidence that this disease would yield to medical treatment. There are certain diseases—special diseases belonging not merely to cattle but to sheep, and even the human subject—which for all practical purposes have ever been looked upon as incurable. Thus cholera is incurable, yellow fever is incurable, small-pox is incurable. (No, no). Men who have had a medical education say yes; it is only those who possess a partial knowledge that say “no” (laughter). It is a most amusing thing that farmers—I say this with all due deference; for I have a great respect for farmers as a body—it is, I say, a most extraordinary thing that farmers and shepherds should set up their opinions on this question against those of the veterinary profession. [A VOICE: “And parsons do so.”] If I were to attempt to dictate to any leading physician as to how he should treat a case of cholera or of yellow fever, he would no doubt consider me a very presumptuous fellow for interfering, with my imperfect knowledge of the matter; and yet we see men who know nothing about medicine, and do not perhaps even know the names of the organs in the animal's body, setting up their opinions as to the curability of this disease, against ours (Hear, hear, and laughter). Many persons speak confidently about typhoid and typhus, when perhaps they could not tell

the meaning of those terms without looking at the dictionary (laughter). Typhus is classed by medical men among incurable diseases; and when we come to look at results not only in England, but throughout the Continent of Europe, we shall find that that view is a sound one. Now, there are two systems of treating the cattle disease, one being called the allopathic, the other the homœopathic system. Homœopaths tell us that they have treated it successfully; I am very glad to hear it (Hear, hear). If they can prove to my satisfaction that they are able to cure 50 per cent. of cases of cattle plague under the same circumstances in which allopaths have failed, I will declare myself a convert to the system directly (Hear, hear). But I will tell you what we are going to do. It has been said, Let them have a trial. They are going to have a trial (Hear, hear). I believe that Dr. Hamilton himself will have placed at his disposal a certain number of cases to treat exactly as he likes, the only condition being that we will take care that they are genuine cases of cattle-plague (Hear, hear). When homœopaths talk about curing so many cases of cattle disease, you may depend upon it that a great number of them are not cases of that disease at all (Hear, hear). Everything is now cattle-plague (Hear, hear); we have no more mouth-and-foot disease in the country (Hear, hear, and laughter); it is all cattle-plague; we have no lung disease now, everything of that kind is cattle-plague; and, looking at these facts, we can easily account for all the alleged cases of cure. Depend upon it that when you have got genuine cattle-plague to deal with, not more than seven or eight per cent. of the cases will ever recover (Hear, hear). We should endeavour to deal with this evil in the way of prevention before animals have been attacked, but we must have recourse to slaughter as soon as animals have become affected. In order to prevent animals from being attacked there must be perfect isolation; and unless there is perfect and complete isolation, it will, I believe, be many a day before this country will get rid of the cattle-plague (Hear, hear). The way to secure perfect and complete isolation is not merely to stop fairs and markets, but to prevent the transit of cattle altogether, and that must be done. It is impossible to draw a line so long as a man is allowed to drive cattle along a road, and hence the only remedy is entire prohibition. We have already lost 15,000 animals, and I believe that without what I am now advocating we shall lose tens of thousands more in the course of a few months. Let me state, in conclusion, that this morning we received accounts of no less than 299 fresh outbreaks of this disease (Hear, hear).

Mr. J. WILLIAMS (Baydon, Hungerford) said two observations had been made that evening to which he wished to reply. One gentleman said that the farmers of England had never spoken out on this subject, and that it was owing to that course that they were in the predicament that they were. As one of the farmers of England he hoped to speak out that evening before he sat down. Professor Simonds said he thought the Government had acted a noble part in this manner. He denied that, and maintained that the Government had acted in a way to which no other class than the farmers of England would submit (cheers). He meant to speak out on that occasion. He would take them back to the year 1840, and ask Professor Simonds what the Government had done since that period? Were any of these diseases known in England before the importations of cattle which had taken place since 1840?

Professor SIMONDS: Yes.

Mr. J. A. WILLIAMS continued: There were some diseases; but this rinderpest was never known till after the Government introduced the tariff—he did not mean to condemn that

tariff—which had brought the Russian disease with it (Hear, hear). Now, with regard to his own county (Wilts), he might observe that there were two farriers there in his district, one at Hungerford, the other at Marlborough, who had received authority to do what? Why, to go into the agricultural districts and visit the sheep-folds and the farm yards where there was any apparent disease. Men who knew nothing about sheep—had authority from the magistrates to come there and do what they pleased. He would mention two instances. Last week he (Mr. J. Williams) lost two sheep from murrain. He knew what was the cause of that. His sheep-dog bit some sheep; the virus of the dog entered them, and the result was that they died. Again, his friend, Mr. Chandler, the inventor of the manure-drill, lost eight fat sheep during the last week. Those sheep were previously worth £3 a-piece; but they too suffered from the same cause as his (Mr. Williams's) sheep; and Mr. Chandler told him only on the previous evening that he had to consign them to the manure tank to make manure for the next turnip crop. The men in authority to whom he had referred—he would not mention their names—were very respectable men, and very talented in their profession, but their experience was chiefly among horses, and they knew nothing about sheep; and if they had seen these cases of Mr. Chandler's, and his own, they might have come to the conclusion that they had the cattle plague (Hear, hear). They did not know half as much as the farmers themselves respecting this matter. The authority which they exercised was given to them by the Privy Council. [A Voice: No; by the magistrates.] He repeated that it was given to them by the Privy Council. There was no Parliament sitting, and the power must come from the Privy Council; it was the members of that Council alone that gave authority to the magistrates, and in their turn the magistrates gave these men authority to order sheep to be destroyed (Hear, hear). The Government themselves introduced this disease. Professor Simonds had clearly proved by his arguments that evening that the disease was imported from abroad. The Government themselves authorized the importation of these foreign animals; and what did they now call upon the farmers of England to do? Why, they called upon them, with a penalty of £20 for disobedience, to slaughter their sheep and cattle (Hear, hear). Was it possible, he contended, that that was doing justice to agriculture? (Hear, hear). Was such a monstrosity ever heard of before? (Hear, hear). If the Government said to them, "You must destroy your animals for the benefit of society" he could understand their conduct; and he was quite willing to admit the necessity of so doing, but they had somewhat more than this to do, and that was, after they had ordered the destruction of these animals, and to be buried 5 feet deep at the owner's expense, to make him compensation for the loss! (Hear, hear). But he could not admit that they acted a noble part, as Professor Simonds said they had done, when they said in effect, "We require you to kill your animals for the benefit of the country, but we will not pay you their value." As regarded the cattle disease, he was happy to say that he knew nothing of it personally; but he believed it was propagated at the different markets and fairs. A young man, who went to Kingsdown fair, bought there 140 sheep, which were afterwards brought to the neighbourhood of Marlborough. They were, he believed, over-driven, and the whole were dead. As regards about half of them, a number of gentlemen in the neighbourhood offered to pay about £1 a head for them, and the owner received £60 as compensation for having them killed, and this had completely stopped any infection. Mr. Williams concluded by observing that he had the honour of introducing a new member that evening in the person of Sir

George Jenkinson, Bart., who desired to take part in this discussion.

Mr. E. TATTERSALL (Knightsbridge) said in a conversation which he had some time ago in Yorkshire, with a gentleman who had passed the greater part of his life as an officer in the Austrian service, he learnt some circumstances connected with the cattle plague which perfectly frightened him. It was not till then that he had any idea of the great national danger with which we were threatened. What that gentleman told him induced him to write a letter to the *Times*, which with the chairman's permission he would now read, as it bore upon one or two points which had been touched upon that evening. This letter was dated the 20th of September, and was as follows: "When in Yorkshire a few days since I met with a gentleman who had passed the greater part of his life as an officer in the Austrian service. We spoke of the cattle plague, and he treated it as undoubtedly being the 'rinderpest,' and his opinion was that it would kill a great proportion of the cattle in England. He told me that when it made its appearance in Austria, as soon as it broke out in a particular district, a line was drawn around the parish, varying in circumference, and every head of cattle killed, whether attacked or not, and no cattle allowed to go on to the infected ground for a given period. Experience had proved that it was the only effectual means of stopping this dreadful disease, which he had known to destroy immense herds. I inquired who compensated the owners of the cattle, and he said, 'The Government.' Now, believing as I do that this is the 'rinderpest,' and believing nothing of the spontaneous nonsense theory, and believing that the disease is spreading and will spread, will it not be the wisest, best, and cheapest plan in the end, at once and literally, boldly to 'take the bull by the horns' and kill him, bury the already infected animals, and send the others to market while fit to be sent? But then comes the important question, Who is to pay? The country ought; I speak as a consumer, and I believe it will be the best, the most honest, and the cheapest plan in the end, to make it a national question, and the sooner the better. It is unfair to expect the agricultural interest to take the burdens on themselves. Many of them are great sufferers already. This is a question is vitally affecting the well-being of the citizen and the manufacturing and labouring population as it does the landlord, the farmer, and the agricultural labourer, and the loss ought to fall on the community, and not upon a class. How this can best be done is not for me to point out. I am told it is done on the Continent, and it may be another instance of the old adage, that 'they manage these things better abroad,' but the new Parliament would surely sanction any steps the Government might think fit to take in such an emergency, when everything depends upon prompt action." That was the simple text of the few words which he had to offer that evening. Having written this letter nearly two months since, it was satisfactory to him to find the opinion which he then expressed, that this disease was the rinderpest, borne out in the able paper of Mr. Howard. They had also heard Professor Simonds, in one of the ablest arguments to which he ever listened, proving that it was the rinderpest and nothing else, proving also that it was communicated from cattle to sheep, and would probably, therefore, inflict one of the greatest losses ever entailed upon this country in any age. The most important question to farmers was, of course, how they were to be compensated for their losses. He was simply a consumer; but he regarded this question as a national one, and he thought no one could pretend to calculate within thousands or even hundreds of thousands of pounds what the loss would ultimately amount to. Let the Farmers' Club, whose voice as

such a question ought to be powerful, urge the Government to do what they all said it ought to do in reference to this matter. Professor Simonds thought the Government had done all it could do under the circumstances. Possibly that was the case. This was not a despotic country, and thank God for it; but Parliament was about to meet, and it became that important body to make its voice heard (Hear, hear). There ought, in his opinion, to be a committee of that Club formed, to take the requisite steps. He did not know whether or not the Cattle Plague Commission was still in existence, but he felt certain that Lord Spencer and the other members of it would have been glad to listen to a deputation from that Club, and he hoped they would not separate that evening without having done something towards laying their opinions before Parliament and the nation. It was a great advantage that they had now a farmer sitting in the House of Commons, who was also a member of the Cattle Plague Commission. The first farmer ever returned to that House was a Norfolk man. Being a Norfolk man himself, he thought that was a great honour to the county, and he also thought that the sooner other counties followed the example which Norfolk had set, the better (Hear, hear). They ought to appoint a committee, who would impress on members of Parliament the necessity of doing justice in reference to questions of compensation. Our laws were founded on justice and honesty; but it was not just or honest for a Government to say to a man, "If your cattle should be attacked, you must kill them; but you shall not be paid for them." Why cause farmers to be ruined for the benefit of others? (Hear, hear). He maintained that no Government had a right to order cattle to be killed without granting compensation. He thought any man would be almost justified in refusing to obey, merely to try the point. He believed that the law of England would bear him out in such refusal. He would therefore move a resolution to this effect—that a deputation from the Farmers' Club should wait upon the Cattle Plague Commission, to state that, in their opinion, it was cruel and unjust to order any man's cattle to be destroyed for the public good, without giving him fair compensation, and to impress upon the Commission the necessity of advising and urging Parliament, as soon as it met, to legislate on the matter, and to make a retrospective as well as prospective law, that every farmer whose cattle were killed for the good of the country should be paid for them by the public.

Mr. H. CORBET, on the part of the committee, asked attention for one moment, particularly after the suggestion which had just been made by Mr. Tattersall. The Royal Commission did them the honour to send to them to inquire whether they could give any evidence on this question; while he might tell the meeting in passing, that that Commission, so far as the taking of evidence was concerned, had now closed its labours, as it had also, he believed, closed, as respected the report to be presented. In response to the invitation received, Mr. John Clayden, of Littlebury, went before the Commission, on behalf of the Farmers' Club. Mr. Clayden was then in the room; and though he (Mr. Corbet) did not know whether or not that gentleman wished to speak, he thought it only fair to the committee of the Club to make known that they had already acted, by anticipation, upon the suggestion of Mr. Tattersall (cheers).

Sir GEORGE JENKINSON, said: Although he came there not to speak, but to listen, on the occasion of his election as a member of that Club, yet having, as a magistrate, paid a great deal of attention to the subject for some months, he would venture to make one or two remarks. He must first protest against the assertion that the magistrates had given an

order for the indiscriminate slaughter of cattle that were supposed to be attacked. That order was issued by the Privy Council, and not by the magistrates, who had no more power to issue such an order than he had to issue an order that any one present should be killed (laughter). He would exemplify what he meant by stating what had occurred in his own county. When an order of the Privy Council was sent down to the petty sessional division of which he happened to be the Chairman, that inspectors should be appointed with such powers as were provided by the Government, he for one protested against that; and he said that he could never consent as a magistrate to give to any set of men power to walk into a farmer's yard and direct cattle to be killed unless the Government undertook to make compensation. He was happy that the magistrates who acted with him in that district entirely concurred in his views on that point, and up to the present moment no such authority had been given. To give inspectors authority to destroy cattle without any remuneration being granted to the owner was, in his opinion, unfair and unconstitutional. With regard to the fairs and markets also, he thought a great mistake was made by the Government in that respect, though Professor Simonds, who so much praised the Government, might be of a different opinion. The Government had in every instance tried to get the magistrates to take upon their shoulders the performance of disagreeable tasks, instead of incurring the responsibility themselves. He asserted with confidence, with regard to every disagreeable order that affected the farmers of England, that the Government had tried to place the work on the shoulders of the magistrates, instead of facing the responsibility which it was incumbent upon it to undertake (Hear, hear). In the days when they had a strong Government, magistrates were not told to do the work of the Government. As to the Government not having power to order compensation for the animals destroyed, it was all fudge. The same power which enabled the Government to give authority for cattle to be killed indiscriminately, and for fairs and markets to be shut up, would enable them to grant compensation to farmers for cattle destroyed under the authority of the inspectors. When Sir George Grey urged the magistrates, as he did lately, to order fairs and markets to be shut up, and went no further, it reminded him (Sir George Jenkinson) of his early soldiering days, when he used to practise the goose or balance step without gaining ground (laughter). Supposing the magistrates in nineteen divisions out of twenty in a county decided upon shutting up the fairs and markets, and those of the twentieth refrained from taking that course, not only would the dealers in the twentieth division get all the custom, but the plague might be disseminated from that division to all the others. Thus they would be just as badly off as if no order had been issued. To give an example in his own neighbourhood most of the fairs and markets were closed; but they were not stopped at Bristol, and the consequence was that diseased cattle which came from London to Bristol found their way into the adjoining district (Hear, hear). Had the Government stopped the markets all over England and Scotland they would have done some good; that was the only way to stamp out the disease. As he said two months ago, nothing but the stoppage of the circulation of cattle along the roads would meet the case, and in his opinion that would be found preferable to indiscriminate slaughter. They had heard so many instances that evening of the ravages of the rinderpest that it would be useless to multiply them; but he would urge upon them, if possible in still more forcible language than that of Mr. Tattersall, the suggestion which was made by that gentleman. He did think the farmers had made a great mistake in not combining to use in relation to this matter the enormous strength which they possessed (Hear, hear). He would ask them to look back to the cotton famine. Was that viewed as a local misfortune? (Hear, hear). Was that allowed to rest on one class? No; the manufacturers as a body combined; they knew their power, and they used it; and until the farmers of England pursued a similar course, until they put a pressure on the Government, through their representatives in Parliament, and exercised that influence to which their numbers, their wealth, and their intelligence entitled them, they would not obtain justice for themselves

with regard to this question (cheers). All such afflictions and dispensations as the present were, he believed, sent by an all-wise Providence for some good end; and if the cattle-plague should teach the farmers of England to help themselves in future by banding themselves more together for their own protection, it would in that way have produced a most beneficial effect. He was not fond of quoting Mr. Bright, but he must say that gentleman had given farmers some good advice when speaking on the subject of the Game-laws; and if farmers combined together, they might at all events compel the Government to adopt better measures in future for regulating the importation of foreign cattle and the transit of all cattle in various parts of the country. With such results, however much they might have suffered, it would not have been in vain (Hear, hear).

Mr. JOHN CLAYDEN (Littlebury, Safron Walden) said: As they had been informed by Mr. Corbet that he had had the honour of representing the club before the Royal Commission on the cattle-plague, he wished to say one or two words in explanation. It would have been presumption in him to have tendered his evidence; but the fact was that the Commission wrote, inviting information from the club; and he (Mr. Clayden) having written a letter on the subject, expressing some strong opinions, was deputed by the committee to go and give evidence. He was very glad to find that the measures which he recommended were in full accordance with the opinion of Professor Simonds, our friend Mr. Howard, and other speakers. It would have been madness for him to say, "Do not allow the importation of foreign animals;" but he said, "Let those which are imported be slaughtered, and let all the cattle be slaughtered that are required for the consumption of the kingdom, and not one be moved alive for at least a month, the skins being disinfected. Half measures, he said, would not be sufficient in such a case as that. A contagious disease like the cattle-plague required strong measures. Lord Spencer asked him whether he would not allow the Metropolitan and a few local markets to be open, if all were slaughtered that went there, and his reply was, that if all animals that went to the Metropolitan and other markets were required to be slaughtered on the spot, injustice would be done to senders, as a limited number of markets would increase the supply of the animals, and the number of purchasers become restricted, as those only who possessed slaughter-houses could purchase them. His concluding remark to the Royal Commission was that he was aware that he was recommending the adoption of harsh and un-English measures; but in such a contagious disease as they had to contend with, he felt that sooner or later they must be adopted. In his own neighbourhood he was happy to say they at present had only a slight infliction of the disease. It occurred some weeks ago on two farms in one parish, from the purchase of London dairy calves. The whole of the animals on those two farms were slaughtered and buried, and it was gratifying to state that there had been no more disease in that parish, nor in the entire sessional division. Nothing can speak louder in favour of isolation than this case does.

Mr. JAMES HOWARD (Bedford) said, Mr. Tattersall had proposed an important resolution; and, as he had consented to put it in more general terms, he had undertaken to second it. The resolution, as amended, was as follows: "That the various legislative questions arising out of the discussion this evening be referred to the committee of the club, with a request from the meeting that it will appoint a deputation to bring this question under the attention of the Government."

Mr. S. SIDNEY (Islington) said he would himself have felt great pleasure in seconding that resolution, because he thought they had now arrived at a few positive conclusions. There could be no question, after the exhaustive address of Mr. Howard, and the speech of Professor Simonds, that this disease was highly contagious, and that up to the present moment no remedy for it had been discovered. What, then, remained? Why, that the farmers and breeders of England should emphatically represent to the Government their views on the subject. With regard to the observations of Sir George Jenkinson, it should be recollected that they were living in a constitutional country; and however desirable strong measures might appear, he hoped he should never see the time when a Minister sitting in an office in London might by a stroke of his pen settle or unsettle the whole trade of the country.

Sir GEORGE JENKINSON: I never said that he should do so.

Mr. SIDNEY continued: Gentlemen could not have the ad-

vantage, whatever it might be, of both despotic and constitutional government in England. The country had not yet made up its mind as to what was wanted. When that was done, and the Government was fully informed on the point, its wishes would, no doubt, be carried out.

Sir GEORGE JENKINSON said he must, with the Chairman's permission, deny having said that any Minister should issue despotic orders; what he said was that the Government had requested magistrates to do certain acts which they should have done themselves if they were to be done at all (Hear, hear).

Mr. WEBBER said: As this disease was a new one in this country, and of such an anomalous character, he should have preferred an inquiry in the first instance for the purpose of ascertaining its nature; and it might afterwards have been seen what remediable measures would do. To him, it appeared, a very wrong course to destroy animals without having given them a chance of recovery.

Mr. TATTERSALL's resolution in its amended form was then put from the chair, and passed unanimously.

The CHAIRMAN said he thought there was very little left for him to say, after the able introduction of Mr. Howard, the elaborate address of Professor Simonds, and the other speeches which had been delivered. A brother-in-law of his, he believed, unfortunate enough to buy the first infected bullocks imported into the county of Norfolk from London; and Lord Spencer remarked to him (the Chairman) on the singular coincidence that more animals were cured out of that lot than out of any other that had come under the consideration of the commissioners. Of 26 animals which his brother-in-law purchased at that time, fourteen were now alive. They were bought in Norwich on the 1st of July, and fell down with the disease on the 4th. He had before him the report from Norwich made up to Saturday evening, and he was sorry to say it was stated that there were a larger number of applications for forms of claims for compensation on that day than on any previous day.

Mr. CHARLES HOWARD then replied. He said the excellent discussion which had taken place had in fact left him but little to say. He regretted that the gentleman who spoke last, did not speak earlier, as he had given expression to sentiments which were not those that had been generally advocated that evening (Hear, hear). One gentleman had alluded to Sir Charles Wood. If the nonsense attributed to the right hon. baronet was really uttered by him, he (Mr. Howard) could not be surprised at his having been rejected by Halifax (laughter). They must all have been pleased with what fell from Professor Simonds, the statements which he made being of the most conclusive character. He must, however, allow him to remark that he did not say that the Government had power to grant compensation; what he said was that he did not know what Parliament might say with regard to compensation. He agreed with other speakers that evening that no other class would have submitted to be treated as the farmers had been, and he hoped the Government would show itself prepared to deal out some measure of justice to that branch of the community. His friend Mr. Lee had, he was afraid, been somewhat annoyed at his allusion to the article in *Bell's Messenger*. Now he begged to say that he meant nothing offensive; but he must be allowed to observe that the cures in question rested on the statements of homœopathic practitioners (Hear, hear). No names were given, and they all knew that when persons had a hobby they were apt to ride it very hard, and to give more credit to it than was due (Hear, hear). All he could say was that he had no prejudice against homœopathy, though a departed member of his family was induced to try that system for a great length of time, and, having found it of no avail, afterwards had recourse to a different system. He was rather pleased to find Professor Simonds standing up for his profession: farmers themselves not liking to be told how they should carry on their business, by persons who did not belong to it. He was not surprised that that gentleman had taken a professional view of the subject, and he regretted that anything had been said in disparagement of that useful body to which he belonged.

On the motion of Mr. SKELTON, seconded by Mr. CROSS-KILL, thanks were voted to Mr. Howard for his introductory paper.

On the motion of Mr. J. A. WILLIAMS, seconded by Mr. COUSNMAKER, thanks were afterwards accorded to the Chairman, and this terminated the proceedings.

## THE CATTLE PLAGUE.

The following is the first Report of the Commissioners appointed to inquire into the origin and nature of the Cattle Plague, dated October 31, 1865—

## TO THE QUEEN'S MOST EXCELLENT MAJESTY.

Your Majesty was pleased, by your Commission dated the 20th day of September, 1865, to intrust to us the task of investigating the origin and nature of a disorder which now prevails among the cattle of great Britain, and is generally designated the Cattle Plague, and of ascertaining as far as possible the mode of treatment best adapted for the cure of the affected animals, and the regulations which may with the greatest advantage be made with a view to prevent the spreading of the said disorder, and to avert any future outbreak of it. Your Majesty was at the same time pleased to ordain that we, or any five or more of us, might have liberty to report to you our proceedings under the commission from time to time, should we judge it expedient to do so.

The terms of the Commission therefore authorize us, if we think fit, to report specially to your Majesty on any part of the subject committed to us, reserving other parts of it for further investigation. The nature of the calamity under which England and Scotland are at present suffering, and which may at any moment attack Ireland, the extensive growth of the disease, its destructive character, and the imperfect success which has hitherto attended all endeavours to arrest its progress, make it clearly our duty to take this course, and to lose no time in humbly presenting to your Majesty such recommendations as, after careful consideration, we believe the emergency to require. We shall introduce them with a brief statement on the history of the disease and on its general character.

## I.

The disease which is the subject of this inquiry was first observed and recognised in Great Britain towards the close of the month of June. Two English cows had been purchased on the 19th of June in the Metropolitan Cattle Market by a cowkeeper residing in Islington, in whose sheds they were when the symptoms of disease attracted, on the 27th, the notice of the veterinary surgeon in charge. Similar symptoms were observed on the 28th by the same surgeon in a cow belonging to a dairyman in Hackney, which had been purchased in the same place and on the same day. Two Dutch cows in a Lambeth shed, likewise bought in the market on the 19th, were attacked on the 24th. The malady broke out immediately afterwards in many London dairies, and spread with extreme rapidity, destroying great number of animals. The Islington cowkeeper lost her whole herd of 93; she afterwards bought more, and lost them also, making 106 or 107 in all. An inspector who had charge of a great part of the north and north-east of London states that in his own district more than four-fifths have either died or been slaughtered, and the general average within the precincts of the metropolis is probably at least as high. Very early in July it appeared in Norfolk; a little later in Suffolk and Shropshire; then in one county after another, and before the end of the month it had invaded Scotland. In all the earlier cases, at least, it seems to have been directly traceable to purchases made in the Metropolitan Market; but in the north and other country markets speedily became, in their respective districts, subordinate centres of infection. On the 14th of October it had extended into 29 counties in England, 2 in Wales, and 16 in Scotland, and was still advancing. The subjoined tabular statement, prepared by the Veterinary Department of the Privy Council-office from such official

information as that department has received from inspectors throughout the country, has already appeared in the public papers:

	Attacked.			Total Cases reported from the commencement of the Disease.				
	Week ending October 14.	Week ending October 21.	Week ending October 28.	Attacked.	Killed.	Died.	Recovered.	Remaining.
1. Metropolitan Police District .....	158	194	158	5773	2557	2520	202	485
2. South Eastern Co. ....	225	154	205	3284	1169	1667	197	251
3. South Midland Co. ....	73	94	230	833	373	282	42	136
4. Eastern Counties .....	141	183	335	3081	1051	1482	161	387
5. South Western Co. ....	17	11	3	116	61	45	7	13
6. West Midland Co. ....	31	9	31	214	74	112	4	24
7. North Midland Co. ....	8	32	18	109	54	41	6	8
8. North Western Co. ....	28	39	42	176	55	75	6	40
9. Yorkshire .....	26	39	113	253	66	126	11	50
10. Northern Counties .....	47	86	34	472	212	201	24	35
11. Monmouthshire & Wales .....	43	60	33	180	51	110	4	14
12. Scotland .....	257	828	696	3182	1153	1241	184	604
	1054	1729	1873	17673	6866	7912	848	2047

It must be remarked, however, that such statements as this cannot be accepted as accurate accounts—which, indeed they do not profess to be—of the real state and progress of the disease. They represent such cases only as the several inspectors have been able to detect since they were respectively appointed. But information reaches the inspector indirectly, by accident, or by common report; and a butcher, jobber, dairyman, or farmer has strong motives for not disclosing to the inspector anything that he can easily hide. We were told by a London cowkeeper that, of forty-one cows which died or were slaughtered on his premises, the inspector got only the knacker's receipt for the eleven that actually died of the disease. It must therefore, we fear, be assumed that the cases reported form but a small proportion of those which have actually occurred; and it would be unsafe to draw from them any inference as to the amount of loss actually incurred by the plague.

Meanwhile, from the same general centre, the Metropolitan Market, it appears to have crossed the sea to Holland with some Dutch oxen which had been shipped from Rotterdam to London, had been exposed during three successive market-days, and, not finding a sale at an adequate profit, had been re-shipped from London to Rotterdam. The disease broke out among them soon after their return, when they were pasturing at Kethel, near Schiedam, in a long strip of meadow, on which other strips abutted, each occupied by stock. It spread at once in many directions, and soon overran the whole province of South Holland, and thence, we believe, it has been from time to time reimported into this country. The measures adopted in the Netherlands seem to have been at the outset less stringent than was desirable; too much discretion was left to the local authorities; but the provinces of North Holland, Utrecht, and Guelderland have, by strictly guarding their respective frontiers, protected themselves in a great measure from the contagion.

In both France and Belgium importation from England has been prohibited, and stringent and minute regulations have been issued by the Government of each country with a view to extinguish the disease wherever it might break out. These measures appear to have been successful. Only a few isolated and somewhat doubtful cases have been hitherto reported from each of these countries.

Twenty-three days at least before the first outbreak in London, a parcel of Russian bullocks, the first, it is asserted, that



were ever brought direct from that country to England,\* were sold in the Metropolitan Market by the importer, a London cattle salesman. They had been shipped at Revel and landed at Hull; part of them had there been sold, and sent to various places in the north of England, and the rest despatched to London. The southern provinces of Russia, are, if not the birth-place, the constant home of a disease which, as we shall hereafter show, is identical with the cattle plague, and to this cargo the introduction of the plague into England has been often and confidently ascribed. Some obscurity hangs over the earlier history of the transaction. That the province of Esthonia, where the cattle were contracted for, and where the bulk of them, at least, were collected, was at and before the date of shipment free from the plague, is certified by authority which we should be reluctant, and indeed have no ground, to question. But it is alleged by the importer's agent, who procured and shipped the animals and had charge of them on the voyage, that a few (13 out of 321) were not Esthonian, but part of a larger lot brought in vans from the neighbourhood of St. Petersburg to make up the number required; and he further alleges that out of this lot two were ill at Revel with a disease which he believes to have been the cattle plague. This part of his story is flatly contradicted by his principal, as his assertion that the animals were not examined on landing is by the Customs' inspector at Hull.† It must be added that he does not know the disease otherwise than by description; that of the 321 imported none appear to have shown any signs of disease, except one, which was ill on the voyage, but looked well when it reached London; and that no animal is proved to have contracted the disease in the Metropolitan Market from the 1st (the date of its supposed introduction) to the 19th (that of its supposed transmission to the Islington, Lambeth, and Hackney cows), a negative circumstance of no great weight, since an early case of the malady may easily have been mistaken for one of pleuro-pneumonia, but not to be left out of consideration. The facts, then, though by no means inconsistent with the theory which attributes the appearance of the plague in England to the Revel cargo, fall far short of establishing that theory, unless we assume that the event cannot possibly be accounted for in any other way. Further inquiry may throw new light on the question. At present we are not able to pronounce a decided opinion on it; nor, for the practical conclusions which we are about to offer, is it material on which side the truth lies.

Another explanation has been suggested in the following extract of a letter from her Majesty's Consul-General at Hamburg:—

"Mr. Schrader, an intelligent veterinary surgeon, who is specially employed by the Hamburg Government to examine cattle and sheep shipped for foreign ports, has informed me he thinks it most probable that the murrain has been introduced into England by importation from Holland. He states that in the course of the last spring a considerable number of Hungarian cattle were conveyed from Vienna into Holland through Germany by land carriage and river navigation; that at the same time the rinderpest had broken out in the neighbourhood of Vienna, particularly in the village of Florisdorf; and that in the month of May a number of cattle at or near Utrecht in Holland had been attacked by it. Although, therefore, the murrain in Holland broke out with much greater violence at a later period of the year, it would be quite possible that it passed from the Dutch ports into England so early as the month of May last. With respect to the rumour of diseased cattle having been imported into England from the Russian port of Revel in Esthonia, either directly or by way of Lubeck, no credit is attached to it here; and, indeed, the great distance of Revel both from Great Britain and from the cattle districts in Southern Russia, seems to render it unlikely that diseased cattle should have reached England from that port without any observation."

\* A copy of an entry from the books of the London Custom-house has been sent to us, from which it would appear that twenty Russian oxen were landed at London from St. Petersburg on the 4th of July, 1860. The point is of no importance.

† It is proper to add that we have been furnished with the original certificate, dated the 29th of May, and signed by the two veterinary surgeons who were charged with the examination of the cargo, that they had examined it, and that it was sound and free from disease, as well as with a subsequent declaration by them to the same effect.

One fact mentioned in this letter, and which has also been elicited in evidence, deserves particular attention, since it is of more than historical importance. Hungarian and Galician cattle now undoubtedly come in considerable numbers to the English market. "Large quantities," says one dealer, "are sent every week." Hungary and Galicia, from their neighbourhood to the steppe country of Russia in Europe, are often attacked by the plague; and Hungary, at least, has suffered severely from it during the present year. The completion of the two great lines of railway which, traversing Central and Southern Germany, now connect Hamburg and Rotterdam with both Vienna and Lemberg, have opened to us these new supplies. Respecting the average duration of the transit, we have no precise information; nor do we at present know how far it may be abridged in particular cases, nor by what regulations it is guarded at the beginning or end of the journey. We may have occasion to recur to this point hereafter. At present we advert to it only as suggesting a possible solution of the question how the cattle plague reached England.

## II.

That the disease in question is contagious, that the contagion is extraordinarily swift and subtle, and that it is most destructive in its effects, there can be no doubt whatever. The manner in which it has spread, travelling perceptibly, for the most part, in the track of animals brought from some centre of infection, and establishing a new centre wherever it has been suffered to effect a lodgment; the very difficulty that has been often found, even where the fact of infection was certain, in tracing the exact means by which the infection was conveyed; the havoc it has made in open pastures not less than in the London cowsheds, and against which fresh air, wholesome food, and carefully tending seem to have afforded no defence, would be quite enough to establish these conclusions, even if no light were thrown upon them by past history or by the experience of other countries. Of the witnesses, indeed, whom we have examined, even those who believe it to have been spontaneously generated here, acknowledge that it is contagious, and, with hardly an exception, admit that it is new in England.

But we see no reason to question the evidence which has been produced before us, proving that it is the same disease as that which has been long known under the name of the rinderpest (cattle plague), or steppe-murrain. The symptoms during life, the results of *post-mortem* examination, and the whole train of general characteristics, are precisely the same, or varied only by such minute shades of difference as we might expect to find in different breeds and climates. A comparison of what we see with the full descriptions contained in foreign medical works leaves on this head no doubt at all; and no doubt is entertained by competent and trustworthy witnesses who have had and used opportunities of personal observation both here and abroad. The whole experience gained of it in countries where it is not, as here, a stranger—countries frequently infested by it, where its effects are perfectly well known, its nature has been carefully studied, and the stricter measures have been devised and are enforced by law to detect and extirpate it as often as it crosses the frontiers—becomes, therefore, at once available for our guidance. These measures are wholly based on the view that the disease propagates itself by contagion, and by contagion alone; and the extreme stringency of them proves in the most forcible manner the violence and activity of the evil which they are designed to keep at bay. They are measures, indeed, which never could be enforced (they involve sacrifices to which no people could be reasonably asked to submit), unless in the presence of a dreaded enemy, and under a sense of overwhelming necessity. The same view is, we believe, universally held among the eminent veterinarians of Germany—men of high education and intelligence; and it has recently been endorsed by the congress of veterinary surgeons held at Vienna in August last, which was attended by members of the profession from almost every country in Europe.

This is not, however, the first time that this plague has visited England. Fatal murrains among cattle, analogous to, if not identical with it, have at various times appeared here. In 1348-9, after the black death had produced great mortality among men, a grievous plague attacked cattle, which perished by thousands. A great rise in the price of food followed, notwithstanding an abundant harvest. The diseased cattle were

slaughtered, and infected herds were as much as possible separated from those which were sound; while the herdsmen who attended the former were not allowed to come in contact with the latter. About a century later (in 1480) a second murrain of the same kind committed great devastation. There is no accurate account of the symptoms exhibited by cattle attacked during these murrains; and we are, therefore, unable to ascertain whether they were different from, or identical with, the present disease; but there is every reason to believe that the distemper which in 1715 made a brief inroad, was promptly expelled, and which in 1745 renewed the attack, and held its ground till 1757, was exactly the same as the present plague. Of this we have proof in the descriptions extant of the symptoms then observed, and of the morbid appearances after death. In a paper communicated to the Royal Society in January, 1746, by Dr. Mortimer, he ascribes the origin of the murrain to two calves imported from Holland by a farmer living near Poplar, early in 1745. The spring and summer had been very wet, the autumn dry and cold, the early winter cold and damp. The disease communicated to the cows of this farmer spread through Essex, reached London, and was propagated in various directions from the metropolitan markets. It entered Berkshire, however, by two cows bought at a fair in Essex. Almost simultaneously with its appearance in London, a violent distemper broke out among the horned cattle of Argyllshire, sweeping off 6,000 beasts; but there is no exact information as to the nature of the Scotch murrain. The disease for some time advanced in a manner which appeared to justify the Government in treating its attacks as mere local outbreaks; and it was nearly a year after its first appearance that the country became sufficiently aroused to use national measures for the repression of it. But by this time it had taken too deep root for these to be effective. A commission for Middlesex was appointed on the 25th of November, 1745. The commission, with the short experience of 1715 to guide them, appointed various cowkeepers and butchers as inspectors of cattle, and instructed them:—

1. To inspect cowhouses and to separate sick from sound cows.

2. To see that all cowhouses and yards were kept thoroughly clean.

3. To kill all sick cows and calves, to slash their hides so as to render them useless, with several cuts from head to tail and round the body, and then to bury them in graves ten feet deep, with two bushels of unslacked lime to each cow.

4. To certify to the destruction of cows, for each of which the Treasury gave 40s.

5. To see that proper returns were made by cowkeepers as to their losses.

The disease having spread beyond Middlesex, an Act was passed, and received the Royal Assent on the 13th of February, 1746, empowering the Crown to issue, through the Privy Council, rules and directions in order to prevent the distemper spreading among horned cattle.

On the 12th of March, 1746, an Order in Council was passed in which the incurable nature of the malady is set forth, and the following regulations appear:—

1. Cowkeepers must shoot infected beasts, and bury them entire with slashed hides, four feet deep covered with lime. (The direction as to the use of lime was subsequently revoked.)

2. All hay and litter used by diseased animals must be burnt. No herdman who has attended a diseased beast is to go near a sound one without changing his clothes.

3. Infected sheds must be thoroughly washed all over, then disinfected with burning sulphur, &c., again repeatedly washed with vinegar and water, and not used for two months.

4. Convalescent animals are not to be mixed with sound ones for one month, and not then till they have been well cured and cleansed with vinegar and water.

5. Flesh and entrails of diseased cattle are not to be given as food to other animals.

6. No man whose herd is infected is to be allowed to drive any cattle, whether diseased or not, beyond the boundary of his farm; and, even when disease has disappeared, his herd is to be held infected for a month.

7. Local authorities, such as churchwardens, overseers, constables, or cattle inspectors who may be appointed, are charged to see the executions of this Order. They are to report to each meeting of justices and make exact returns.

8. These local authorities are to persuade owners to divide up their herds into separate parts; they are not only to see to the burying of diseased cattle, but also the burial of all infected dung.

9. Cattle travelling on roads are to be stopped and examined.

10. Houses, buildings, or yards used for cattle, sound or diseased, are to be carefully kept clean.

11. Compensation for slaughtered cattle is to be paid at the rate of 40s. per head; for calves, 10s.

Towards the end of the year the Government found that the local authorities had not assisted them vigorously in the execution of the first order, and they issued a second to the effect, that from the 27th of December for three calendar months no person shall send to fairs or markets any cattle except for immediate slaughter, or "buy, sell, or expose to sale" any cattle except those which are ready for immediate slaughter. Nor is this privilege of selling fat cattle permitted to anyone whose herd is infected. Therefore all beasts going to fairs or markets must be provided with passes from a justice; or, failing him, from other competent local authorities, given on the owner's oath that his cattle are and have been for a month free from the plague.

No raw hides shall be sold or allowed to be transported without like passes; but hides and horns of diseased beasts must absolutely be destroyed, and a compensation of 10s. per hide is given.

A third Order in Council was issued, proscribing the district from the Humber and Trent, and not allowing cattle to be driven out of it northwards from the 19th of December, 1746, to the following 27th of March.

On the 13th of February, 1747, an Act to amend and extend the powers of the previous Act was passed, and this was followed, up to 1757, by various continuing and enlarging statutes. In addition to the measures before specified, these statutes also provided that sales of cattle should only take place when the seller had had them in his possession for 40 days; calves were not allowed to be sold, in order that they might be preserved for breeding purposes, and severe restrictions were put on the sale of the hides of diseased animals.

Various orders were issued during the year 1747, stopping local fairs, and empowering local authorities to do so when they found it expedient.

The plague in consequence of these orders was extinguished where the local authorities acted with vigour, but lingered in other places, whence it spread after a time as rapidly as ever. In consequence of this, in September, 1747, there is a new suspension of all fairs and markets and of all movements of cattle, except for slaughter, throughout the kingdom for three months. This was modified afterwards, sound lean cattle being allowed to be changed to clean pastures, and cows being allowed to go to bulls when both were sound.

The same result followed this new order as its predecessors. The disease was extinguished in many counties, but lurked in others where the local authorities had been lax in looking after the execution of the order. Hence, in December, 1749, the Council admits its failure in putting down the disease, and now again prohibits all movement of cattle, except for slaughter, and the place of slaughter must be within two miles of the spot where the cattle are on the 14th of December, 1750.

The requirement that cattle should be slaughtered only within two miles of their stalls was found very grievous by London and Westminster, and the outcry raised against it by these influential places produced a revocation of it within a month of its use.

"Unfortunately," says Mr. Youatt, in his well-known work, "the restrictions with regard to the sale or removal of cattle and communication between different districts were so frequently evaded that it was either impossible or impolitic to exact the penalties." (Youatt, *Cattle, their Breeds and Diseases*, p. 391). The system of compensation was carried on for some years until the Government found it produced serious frauds. Every animal that was ailing, or had diseases of any kind, was killed and charged to the Government as having died by the plague, and in consequence of these frauds compensation was abandoned. One cause of the ill success of the repressive measures adopted is thus described in the words of Layard, who, writing even in 1757, says: "The disease, thank God, is considerably abated, and only breaks out now and then

in such places where, for want of proper cleansing after the infection, or carelessness in burying the carcasses, the putrid fumes is still preserved, and is ready, at a proper constitution of the air, or upon being uncovered, to disperse such a quantity of effluvia that all the cattle which have not had it will be liable to infection."—(Layard, *The Distemper among Horned Cattle*, p. 20).

For some time after the revocation of the Order of 1749, each county proscribed neighbouring infected counties, and refused to receive their cattle. The roads from one county to another were strictly guarded, and cattle, hides, carcasses, and tallow from any infected counties were carefully excluded. These measures, however, had but a very partial effect. Cheshire lost in the first half of 1757 and three months of the preceding year about 30,000 head of cattle, and many other counties in proportion. For the next two or three years this local war against the disease was allowed to be waged, the Government occasionally interfering when the magistrates permitted fairs in places likely to be injurious to neighbouring counties. It continued up to 1756, with considerable variations, the plague being intense in some counties, milder in others, and absent from many, until it wore itself out. There is no accurate record within our knowledge of the mortality produced by it. In the third year of the attack 80,000 head were slaughtered under the Orders in Council, and a far larger number perished by the disease. During its course it must have destroyed several hundred thousand cattle.

There was some dispute as to the means by which England received its infection in 1715 and 1745, but it is certain that the plague was raging in different parts of western Europe at that time. Wherever during war Russian and Austrian parks of cattle followed the movements of armies, the cattle plague appeared, and spread gradually to the adjacent countries. France in this way received it at least half-a-dozen times in the last century.\* From 1711 to 1714 foreign authors state that western Europe lost 1,500,000 head of cattle by the plague; while from 1745 to 1748 (a period which includes three years of the great English attack) 3,000,000 are believed to have perished in western and central Europe. These figures are probably not exaggerated, considering the great losses sustained by particular States. Thus the Danish monarchy, in the four years from 1745 to 1749, lost 280,000 head, and Holland, in three years beginning with 1769, lost 395,000 head. These disasters attracted the attention of Governments and scientific men, and the long peace which began in 1816 permitted the adoption of those careful and systematic measures of precaution which, in the countries bordering on Russia, have been maintained ever since with various modifications, and, on the whole, with considerable success. It was ascertained that Europe usually received the infection through Russian steppe cattle sent into Poland and Hungary. These cattle feed in vast numbers on the luxuriant herbage of the steppes in the Russian provinces watered by the lower part of the Dnieper and its tributaries. Large herds of them are annually driven to different parts of Russia, to Poland, Galicia, and Hungary, and often carry with them the seeds of disease in their train. In 1862 the number attacked by the plague in the Austrian dominions was 296,000, of which 152,000 died. In 1863, it again invaded and overran not only Galicia, but the whole of the kingdom of Hungary and its dependencies, the Bukowina, Dalmatia, Carniola, Lower Austria, Moravia, and Styria. Fourteen per cent. of the cattle in these countries took the infection, and the average mortality, as stated in Schmidt's *Jahrbuch der Gesammten Medicin*, 1865 (p. 95), was as follows:

	Per cent.		Per cent.
Hungary.....	65	Moravia.....	88
East Galicia .....	77	Lower Austria .....	92
Croatia and Slavonia...	81.6	West Galicia.....	94
Military Frontier .....	83	Bukowina and Styria..	100

It should be added that the number attacked in the last two provinces was small.

### III.

Our present experience, then, our past experience, and the

\* Much interesting information on this part of the subject is contained in a memoir by M. Renaut, President of the Veterinary School of Alfort, transmitted to the French Minister of Agriculture, and published in several French and English newspapers.

experience of foreign countries, coincide so far as they respectively go; they identify the English plague of 1865, the murrain of 1745, and the rinderpest of Eastern Europe, as the same disease, and they yield some clear and well ascertained results, which may be briefly stated as follows:

The cattle plague is, in the language of medicine, a specific disease, belonging to the class of contagious fevers. The contagious matter is subtle, volatile, prolific, in an unexampled degree. It is conveyed in a most virulent form in the excretions from the diseased animal. Any particle of those excretions may serve as a vehicle for it. We know not the limit of time within which it disengages itself from them, nor to what distance it may not be diffused. It may travel, we know, in the hide, horns, hoofs, and intestines of the dead animal; the offal, therefore, is highly dangerous. It lurks undeveloped in the system for a period about which some difference of opinion exists, which is certainly not less than five days—usually seven or eight, but appears to be more prolonged in some cases. Towards the end of this period of incubation, but at what precise point we do not know, it becomes capable of diffusing itself by contagion. A diseased animal may, therefore, be infectious before it shows any signs of disease, or, at all events, before the malady betrays itself to any but a very close and very skilful observer. The proportion of cases in which it is fatal is extraordinarily large. No specific has been discovered which neutralizes or expels the poison; judicious treatment may enable nature to resist till the virus has spent itself; injudicious treatment may have a contrary effect; but that is all. The practical conclusion, therefore, at which foreign physicians and foreign Governments have arrived—the conclusion that it is better always to kill a diseased animal, or a few diseased animals, where by so doing you can kill an isolated germ of disease, instead of suffering that germ to linger and fructify while you are attempting a cure, for the precarious prospect of an insignificant saving—is justified by reason: it is also directly justified by experience, which shows that, while the plague, propagated from a single germ, speedily becomes unmanageable, spreads from herd to herd, from province to province, and from country to country, multiplies in a continually increasing ratio, and exhausts itself only after ruinous havoc and a long course of time, it may be effectually eradicated by prompt and unsparing measures. The experience of Prussia is especially valuable in this respect. The plague has often appeared, says Professor Gerlach, in the provinces bordering on the Russian Empire, in East Prussia, Posen, and Silesia, but it has never since 1816 penetrated eastwards, even so far as Brandenburg. Lastly, we must add, it has not been found to give way before cold weather or rain. The reverse seems to be the case. It is worse, Professor Gerlach informs us, "in cold and wet weather, and better in warm and dry weather." "It spreads," says Mr. Ernes, "as fast in a cold as in a hot season." The murrain of 1745 broke out here in early spring, the temperature of the preceding year having been low; and it is stated to have raged most violently during the winters, and to have diminished in intensity with the advance of summer.

These conclusions, which are all that for our present purpose it is necessary to state, are far, of course, from exhausting all that is known upon the subject. Beyond what is known, however, there is a large field of inquiry which may be usefully explored. To observe carefully the premonitory and progressive symptoms of the disease under various conditions—to determine precisely the period of incubation, the effect of remedial and of preventive agencies (including under the latter head disinfectants, therapeutical measures, and inoculation)—to ascertain within what range and under what modifications the poison may be communicated from a diseased cow to other animals of the same or different species—these are branches of investigation practically important, but which will take time. With a view to the thorough examination of them, we have obtained the assistance of men eminent in various departments of science, and we hope to be able to report on them hereafter. But we have now to deal with more pressing questions. Are the measures hitherto adopted to stifle the plague at home and stop its entrance from abroad effectual for the purpose? If not, what other measures are likely to be effectual? To these questions, having early satisfied ourselves of the general character of the disease, we at once directed our attention; and the evidence which we have received has been chiefly taken with a view to them.

## IV.

The preventive measures hitherto adopted by your Majesty's Government may be briefly stated.

By an Act of Parliament passed in 1848, and continued by several subsequent Acts to the present time, the Lords and others of your Majesty's Privy Council, or any two or more of them, are authorized to make from time to time such orders and regulations as to them may seem necessary for the purpose of prohibiting or regulating the removal to or from such parts or places as they may designate in such order, of sheep, cattle, horses, swine, or other animals, or of meat, skins, hides, hoofs, or other part of any animals, or of hay, straw, fodder, or other articles likely to propagate infection; and also for the purpose of purifying any yard, stable, outhouse, or other place, or any waggons, carts, carriages, or other vehicles; and also for the purpose of directing how any animals dying in a diseased state, or any animals, parts of animals, or other things seized under the provisions of the Act, are to be disposed of; and also for the purpose of causing notices to be given of the appearance of any disorder among sheep, cattle, or other animals, and to make any other orders or regulations for the purpose of giving effect to the provisions of the said Act, and again to revoke, alter, or vary any such orders or regulations; and it is enacted that all provisions for any of the purposes aforesaid in any such orders contained shall have the like force and effect as if the same had been inserted in the Act; and that all persons offending against the Act shall for each and every offence forfeit and pay any sum not exceeding £20, or such smaller sum as the Council may in any case by such order direct.

Under the powers conferred by this Act several Orders in Council have been issued, dated respectively the 24th of July (14 days after the first notice of the outbreak was given by Professor Simonds to the Privy Council-office), the 11th, 18th, and 26th of August, 1865, the substance of which was afterwards embodied in a consolidated order, dated the 22nd of September, 1865. This consolidated order contains the regulations now in force relating to England, Wales, and Scotland. Some further orders have been made prohibiting the importation of horned cattle and sheep, and regulating the portation of hides, from Great Britain into Ireland, and likewise prohibiting importation into the island and barony of Lewis.

(a.) Under these orders inspectors have been appointed by the Clerk of the Council for the Metropolitan Police District; as to all the rest of Great Britain, the appointment of inspectors is discretionary in England with the justices of each Petty Sessional Division, in Scotland with the County Justices in Sessions; within municipal boroughs the power is invested in the mayor or provost. The discretion, however, may only be exercised where the local authorities are satisfied of the existence of the disease in, or have reason to apprehend its approach to (this was added on the 26th of August), the district over which their jurisdiction extends.

(b.) Every inspector is empowered to enter and inspect all premises within his district in which any animal (this word is defined as including neat cattle, sheep, goats, and swine) may be found, to seize, slaughter, and bury animals diseased, and to disinfect the premises, and to order the separation of animals suspected of being diseased.

(c.) Owners of diseased stock are forbidden, absolutely, to send to market or expose for sale, to send by highway, railway, or coasting vessel, or, lastly, to turn out on common or unenclosed land any diseased animal. If within an inspector's district, they are also forbidden, without the inspector's leave, to remove from their premises any animal which is diseased or has been in the same shed or herd, or in contact with a diseased animal; or to place any diseased animal in any field or pasture where, in the inspector's judgment, it would be likely to propagate the disorder.

(d.) The local authorities may, by published notice, exclude all animals, or any specified description of them, from any fair or market within their jurisdiction; and no animal is to be sent to the Metropolitan Cattle-market so long as the plague exists within the metropolitan police district, "except for the purpose of being there sold for immediate slaughtering, and every such animal, as soon as sold, shall be marked for slaughter in the same manner in which cattle are ordinarily marked for slaughter in the Metropolitan Cattle-market." The two latter provisions date from the 22nd of September.

Inspectors have been appointed under these orders in a large number of districts. Cattle landed at the port of London, or at any of the outports, are inspected on landing by inspectors appointed by the Board of Customs, who are now veterinary surgeons, except in a very few cases where no veterinary surgeons can be procured.

These orders have not arrested the march of the plague, nor can we persuade ourselves that they will materially serve to arrest it, now that it has spread so widely.

Inspection is the instrument on which the chief reliance is placed. But it is not enough to clothe an inspector with the most ample powers as to diseased cattle if he cannot certainly know whether a beast is diseased or not. During the period of incubation, as the evidence shows, even a skilful practitioner may be at fault. Nor are we by any means sure that in all the infected districts a sufficient number of competent persons have been found skilled in the diseases of cattle. The demand has been sudden. We have reason to doubt whether it has called forth an adequate supply. At any rate, many cases have been brought to our notice in which tradesmen or others without professional qualifications have been charged with this office. It must be added that an inspector, set to fight single-handed in his own district against this insidious enemy, with a private practice, and among farmers and butchers to whom he looks for employment, has a hard task to perform, and is likely to find their motives and opportunities for concealing the disease more than a match for his means of detecting it.

An important step was taken by prohibiting stock from being sent to the Metropolitan Market, except for immediate slaughter. But how is this prohibition enforced? The beast, if sold, is marked by clipping the hairs of his tail, and this is understood to mean that he is marked for the butcher. But such a mark is sure to lose its significance as soon as the regulation becomes notorious; and, significant or not, there is nothing in it to prevent him from being carried into the country, turned out to graze, or resold, while unsold animals are not marked at all. Cases of this kind, where the animals carried infection with them, have been brought to our notice. In fact, of all the cattle which are sent from the country into London, about one-third, after having stood in the market, are distributed again from London over the country.

The discretionary power given to local authorities of closing wholly or partially fairs and markets is still more important, provided it be exercised generally, promptly, and firmly. But, in the first place, such a power is not proper to be intrusted to mayors of boroughs and justices of petty sessional divisions. Wider interests are concerned than these little circles enclose. The mayor of a town, to which its market brings large and regular profits, is not the fittest judge of the expediency of closing that market before it becomes a source of infection to the surrounding rural district. All justices are not equally firm, equally ready to do an unpopular thing, equally convinced of the magnitude of the calamity. A large number of markets and fairs have, it is true, been closed, one by one, against lean or store cattle; the example once set has been gradually followed. But what has been done has not been done uniformly. In some places all fairs and markets for both store and butcher's stock have been stopped; in others those for store stock only. The periods of stoppage also have been very various. Here, however, uniform action is everything. Restraints on the ordinary course of business and traffic must be of brief continuance if they are to be strictly enforced; they must be sharp and sweeping if they are to be brief. What is necessary to be done should be done at the same time, wherever it is necessary, or it might almost as well not be done at all. In the second place, the prohibition is easily evaded, and does not go far enough for even its limited object. It is evaded (this also has been repeatedly urged on us) by auctions and other public but unauthorized sales, conducted without even those imperfect checks and safeguards which exist at a market or fair.\* Small jobbers, too, we are informed, are beginning to roam the country with droves, out of which they supply customers who are not nice as to what

\* A later order, issued on the 31st of October, prohibits, wherever fairs or markets have been closed, by the local authority, the "bringing or sending" of any animals to any place for the purpose of exhibition or sale, and the receiving, exhibiting, buying, or selling of animals so brought or sent.

they buy. It would be difficult to invent means better adapted to sow infection broadcast.

We are convinced, then, that other measures are required. We proceed to consider what those other measures should be. In doing so we shall endeavour to point out clearly the general course which we think should be pursued, without entering into details, which more properly belong to your Majesty's Government.

### V.

We are perfectly sensible that this a question of extreme difficulty. The difficulty lies in the magnitude of the sacrifices we have to call for, the inadequate notion which prevails of the extent of the evil to be subdued, the facilities for dishonest evasion, and the risks from inadvertence which spring up with every attempt to mitigate those sacrifices. For it must be observed that we have not merely to guard against criminal or unscrupulous acts; nothing is easier than for a man, without being guilty of so much as gross negligence, to become the means of spreading infection over a whole county.

Let us first say a word about the system employed with so much success in Prussia; we mean the system of *cordon*s, by which infected places are isolated, and the disease either suffered to exhaust itself or stamped out by indiscriminate slaughter. Nothing can be more efficacious where the disease is confined to a very few points; but in order to be efficacious the isolation must be complete and must be soon over, and slaughter (as the Germans themselves hold) is merely wasteful where the number of animals is large. When the disease has widely diffused itself, and disappears at one point only to appear at another, the difficulties of isolation become greater and the chances of its being efficacious less. We need hardly add that in countries accustomed to a strict half-military police and the constant presence of soldiery, where men and cattle are lodged in close-packed villages encircled by tracts of open ground, and where the system itself is so well known and the necessity for it felt, it finds facilities which would be wanting among our lanes and scattered homesteads, with a people to whom it was novel, and who are unused to restraints and jealous of interference. These considerations are by no means conclusive against the application of it, with some modifications, to England, far less against resorting to it in Ireland, but they warn us against expecting too much from it, or relying on it alone.

Against a disease which is highly contagious, undiscoverable at a certain stage, and too widely diffused for an army of inspectors to cope with it, there is clearly but one remedy which would be certainly and absolutely effectual. That remedy is to prohibit everywhere for a limited time any movement of cattle from one place to another. Enforce this, and within a time which cannot last very long the disease is at an end. It must stand still, and it must starve for want of nutriment. This great sacrifice would certainly eradicate the evil; we cannot say so of any sacrifice less than this.

We are perfectly sensible of the vast train of losses and in conveniences, public and private, which must attend upon such a measure; and the possibility of mitigating them by circumscribing the prohibition in different ways, without rendering it ineffective, is a point to which we have given the most anxious consideration.

The distinction which may be drawn between lean and fat stock, or rather between cattle moved from place to place for the sake of grazing or fattening, and cattle moved with a view to immediate slaughter, here suggests itself at once. In the case of store stock the risk of propagating infection is, on the whole, great, and the evil of stopping circulation is less. The farmer who has lean animals to dispose of, and the farmer who has winter food for them to consume, must undoubtedly suffer; and there might be reason to apprehend some diminution in the supply of winter-fed stock for the spring and early summer of next year. But it must be remarked that the fear of infection now deters many farmers—in infected counties, indeed, all but the very needy or the imprudent—from buying at store markets; and that the persons who would lose most by the application of the remedy are also those who are most deeply interested in the matter, and will be the greatest losers if no effectual remedy is found. We have little difficulty, therefore, in arriving at the conclusion, not only that public sales of lean stock should be suspended for a time, but that private sales, over which it is impossible to exercise an effective control, should be stopped likewise.

On the other hand, to interfere with the circulation of fat stock is to interfere directly with the least market; and to embarrass it, is to raise, for a time at least, the price of meat. To require that every bullock sold for slaughter shall be slaughtered on the premises of the seller will, undoubtedly, in a multitude of cases be inconvenient to both farmer and butcher. There will be difficulties about the actual slaughtering, about the disposal of hides and offal, about transport; and these difficulties appear still more serious when we consider the manner in which the live-meat trade is now carried on, through salesmen and jobbers, and the vast quantity of fat cattle continually in motion to and from London, and from one market to another. A large system of trade and transport will have to be deranged, and many new arrangements to be made, and the cost of effecting these changes on the spur of the moment must fall, to a considerable extent, on the consumer of meat.

If the distinction be admitted, however, many other questions arise. In the first place, how is it to be enforced? If a privilege is conceded to cattle destined for the butcher, how are we to make sure that a particular animal is really destined for the butcher, or that he will be slaughtered immediately or slaughtered at all, or that he will not scatter infection on his road? May he be driven home by the nearest country butcher who will buy him, or must he be sent to market? May he go to any market, or only to one where conveniences for slaughtering and for careful inspection are or can be provided? May he, if unsold, be sent home again, or transported from one market to another; or if not, what chance will the seller have, should the market be overstocked, of making a fair bargain? In considering these points it must be borne in mind that a butcher has, as some witnesses have remarked to us, facilities which a farmer has not for concealing the presence of the disease, and that he has not those motives for being on his guard against it which the farmer has. A farmer who brings home a diseased animal may probably lose his whole herd. But it is often the butcher's interest to do so no questions.

Answers more or less complete may be furnished on all the points above enumerated, and precautions may be devised with a view to each of them. In general terms it may be stated that such precautions must in the main rest on some or all of the following expedients:—On a modified adoption of the *cordon* system; on the imposition of new and peculiar obligations upon butchers, and probably upon drovers, railway companies, and the authorities in charge of markets; lastly, on a system, more or less extensive, of permits, certificates, or declarations. We ought not, however, to shrink from distinctly saying that no answers can be given which, in our judgment, are perfectly satisfactory, and no precautions invented on which it is possible entirely to rely; and that we believe it to be best for the country, and even for the interests which will suffer most in the first instance, that the prohibition against the circulation of cattle should be maintained in its integrity.

We have stated frankly the difficulties and sacrifices by which the country must be prepared should this proposition be carried into effect. Of these difficulties the one which will probably be felt most strongly relates to the supply of food in the great towns. Fears have been expressed that to close the Metropolitan-market, for instance, against the influx of cattle from the country would create a famine. We have already seen that the attempt to restrict the markets of London and Westminster during the plague which raged here in the reign of George II. was given up on account of the clamour which it created; and it may be argued that the same thing would happen now. Circumstances, however, have widely changed. In the days of George II. meat could only be transported to London alive; even the roads along which the cattle travelled were what we should now think few and bad; there was little importation from abroad, and some difficulty must have been often found in supplying the wants of the metropolis by the ordinary means of communication. Now, every place where fat cattle are fed in large numbers is approached by railways, which can transport dead as well as live meat; and it seems no unreasonable demand to require that, for the sake of averting a calamity of almost incalculable magnitude, London should be content to be supplied with dead meat from the provinces, instead of constituting herself a hotbed of infection by receiving twice a week great throngs of living cattle. This

change is, indeed, in itself economical and advantageous, and appears to be gradually taking place as a natural consequence of the extension of the railway system. There is obviously an immense waste of labour in bringing the live animal to London in order that certain portions of its carcass may be consumed as human food; dead meat is more easily carried than the living creature, and it seems quite as reasonable to carry the butcher to the ox as to bring the ox to the butcher. We are informed that from Aberdeen alone upwards of 1,000 carcasses are sent up weekly to the English metropolis during eight months of the year, and 300 or 400 during the remaining four months, and that special dead-meat trains leave Aberdeen on this errand five days in the week. Nor is it to be forgotten that London is at the present moment fed in a great measure with foreign cattle. From the 16th of September to the 18th of October last, both inclusive, the number of English beasts in the market was but 14,615 to 20,185 foreign. It must further be observed—and this is the most important point—that a general prohibition is capable of being thoroughly enforced. The mere presence of a beast on any highway will be sufficient to prove the infraction of the rule. Any plan which, while laying down the general prohibition, admits exceptions in favour of cattle removed to particular places or for particular purposes, must rest upon the ascertainment of facts more or less complicated, to be proved by certificates from local authorities, upon the accuracy of which, experience warns us, little reliance can be placed. The liberty to remove cattle for particular purposes is sure to be extended and abused for other purposes. A man has only to profess an intention in accordance with the law, in order, by a little dexterity, to obtain under such a system the utmost facility for violating the law. It will be a long time before the rules are understood, and the period in which they are violated through ignorance will be succeeded by the period in which they are evaded by design. England is probably the worst country in the world for the working a system of certificates, permits, licences, and passports; and the temptation to violate the rules will be very great, for the thought that naturally occurs to everyone whose herd is attacked is to conceal the existence of the disease until he has got rid of those animals which do not yet show symptoms of its presence. To the objection, true as far as it goes, that the embarrassment thus thrown in the way of trade will probably tend to raise the price of meat, it may be answered—first, that such a rise in the price of meat will afford at the expense of the community the means of reimbursing the trade for the sacrifices it has made for the common benefit; and, secondly, that the immense destruction of cattle which such a measure is alone calculated to prevent is likely to raise the price of meat to a higher point, and for a longer time, than a regulation which really does little more than change the place of slaughter from large towns to country districts and places of importation. In the period from 1745 to 1757 almost every measure, short of the one which we are considering, was tried in vain. The disease at first advanced slowly, but it lasted twelve years, and then died out, apparently for want of animals susceptible of its influence, although the difficulty of communication from one part of England to another offered at that time the fairest chance for the success of palliative measures. England has now to contend with the plague under disadvantages never experienced by any other country. The density of her population, the large quantity of her horned stock, and, above all, the enormous facility of communication by railroad, make her peculiarly liable to the ravages of a contagious disorder, and render the prospect of eradicating it within any reasonable time, either by slaughter or by curative and disinfecting measures, almost hopeless.

#### RECOMMENDATIONS.

##### 1. SUSPENSION OF CATTLE TRAFFIC IN GREAT BRITAIN.

For the reasons stated above we feel ourselves compelled to recommend to your Majesty that such measures shall be taken as may be requisite to invest, with as little delay as possible, some high officer of your Majesty's Government with the power of suspending for a limited time the movement of cattle from one place in Great Britain to another, for extending or shortening such period, and for renewing the prohibition as often as circumstances may render necessary.

##### 1a. SUGGESTED REGULATIONS AS TO CATTLE TRAFFIC, SHOULD RECOMMENDATION 1 NOT BE ADOPTED.

We believe that this measure offers, as we have already said the only certain means of eradicating the disease, and we conceive that the end amply justifies us in proposing to the nation so great a present sacrifice. In submitting this, however, as our first recommendation to your Majesty, we are well aware that it is likely to excite much opposition; that the difficulties to which we have adverted may to some appear insurmountable, and that to those who do not regard the cattle plague in so serious a light as we do the remedy may seem worse than the evil. This view may possibly be shared by your Majesty's Ministers; we think it right, therefore, to go further, and to indicate the measures which might, in our opinion, be advantageously adopted, should an absolute suspension of the movement of cattle in Great Britain not be enforced.

a. For a period to be fixed, and which might, if necessary, be extended, no lean or store stock should be permitted to be sold at any fair or market, and sales of such stock by auction or advertisement, or in any other manner whatever, should be prohibited.

b. Cattle might be moved for immediate slaughter to a market or to a slaughterhouse licensed for use, but only under a licence for transit granted by the magistrates in Petty Sessions. The licence for transit should certify to the healthiness of the district from which the cattle come. With this exception, and except in the case of cattle driven from one part of the same farm to another, the transit of cattle over any public road (including railways), or in any coasting vessel, should be absolutely prohibited.

c. Precautions should be taken that every animal sold for butcher's meat be slaughtered within a short and fixed period. It may be convenient for this purpose that no slaughterhouse should be used without a licence from the local authorities, and no such licence given except on the butcher's undertaking to have all cattle which may be sold or consigned to him driven direct to the slaughterhouse or premises attached to it, from whence they are not to be moved alive. Cattle sold at a fair or market should not be allowed to leave the precincts of the borough or other place where the fair or market is held (in the case of London, the Metropolitan Police District) alive. To ensure this object, it might be required that cattle entering a fair or market should be branded or marked on entrance, and cattle sold elsewhere to a butcher similarly marked at the time of sale, and that it should be penal for any one but a butcher to have a marked animal in his possession. If any regulation of this kind is adopted, it would be advisable that in every place where a public market is held, lairs should be provided in which unsold animals could remain from one market-day to another.

d. It would be desirable to draw some more distinct line between infected and uninfected districts than is at present traced by the orders in Council. For this purpose, whenever a case of infection is discovered, or is known to have existed within a certain period before the time when these measures may come into operation, the district should be "proclaimed" as infected in the *Gazette* and the county papers. The egress of live cattle from a proclaimed district should be strictly prohibited, but cattle slaughtered within it and certified by the district inspector to be fit for food might be sent out of it, under proper safeguards for disinfection. Provision should be made for enabling districts which had been proclaimed to be publicly set free, on proof being furnished that all risk from infection was at an end.

This latter proposal would, if adopted, strengthen the inducements of the inhabitants of infected districts to rid themselves of the disorder, and those of their neighbours to watch vigilantly against its approach.

##### 2. POWERS OF INSPECTORS.

We are of opinion that the power to seize and slaughter vested in inspectors by the Consolidated Order may properly be withdrawn; or that, if retained, it should be exercised only in cases where the inspector's directions as to the separation of sound from diseased stock, &c., or any general preventive or sanitary regulations issued by the Government, are not complied with. This power is right and useful when the disease has appeared only at isolated spots and attacked a few animals; the public benefit is then very great, and the private sa-

crifice small; but in proportion as it extends, the hope of thus arresting its march diminishes, the inevitable waste increases, and the sense of hardship tends to become insupportable. In principle, a system of compulsory slaughter should be complemented by a system of compensation, and the objections to promising compensation to individuals out of the public treasury on an extensive scale appear to us insurmountable.

### 3. FOREIGN CATTLE.

No reference has hitherto been made to cattle imported from abroad. Should our first recommendation be entertained, and an absolute embargo placed on all traffic in cattle within Great Britain, we think that imported cattle should be slaughtered at the ports of landing. We are further of opinion that cattle should be allowed to land at certain ports only, where proper facilities can be afforded for inspection and transport. In the other alternative, it will be sufficient to say that foreign cattle, if passed by the Customs' inspectors, and not coming from an infected district, may be sent by railway to any market in Great Britain, but shall be then subject to the same regulations as British cattle.

### 4. UNINCLOSED LANDS.

During the period of prohibition, whether absolute or limited, no cattle should be allowed to be turned on common or uninclosed land.

### 5. PERIODICAL RETURNS.

It is highly desirable that steps should be taken for obtaining periodical returns of the horned cattle and sheep within the area of every parish of Great Britain, and of their sanitary condition, with especial reference to the present disease.

### 6. IRELAND.

Before this Report is concluded, some reference should be made to the peculiar circumstances of Ireland. The disease not having as yet broken out in that country, there is no necessity for the measures which have been recommended for Great Britain. It is still possible, by the adoption of suitable precautions, to avert the calamity from Ireland altogether. The importation of cattle into that country has already been prohibited for some weeks past. Considering, however, the destructive character of the disease, it will not be judicious to rely upon that precaution alone for escaping it. The evidence which has been laid before us leaves little doubt that it can be conveyed by persons who have been in contact with infected animals, as well as by the animals themselves. In case it should, by any accident, be carried over, the Government should be in readiness to eradicate it from any spot in which it may appear; and unless preparations are made for doing so before the plague shows itself, the authorities will hardly be in a condition to act with the necessary speed and vigour when the emergency arises. In Prussia, upon whose eastern frontier the disease frequently appears, a system of precaution has been adopted for stopping its further progress, which has hitherto met with invariable success. It would probably not be difficult to make provision for the application of similar measures to Ireland, and so to secure to it a permanent immunity from the calamity under which Great Britain is at present suffering. But the extreme rapidity with which the disease spreads makes it important that all arrangement for stamping it out, in case of its possible appearance, should be made without delay.

We append to this Report a short series of practical suggestions, drawn up by those members of the Commission who are professionally qualified to deal with sanitary subjects, and which may be useful at the present time to owners of cattle.

ROBERT LOWE.	E. A. PARKES.
LYON PLATFAIR.	THOS. WORMALD.
RICHARD QUAIN.	ROBERT CRELEY.
	CHARLES SPOONER.

Oct. 31.

The following is a separate Report of Earl Spencer, Viscount Cranborne, Mr. Read, and Dr. Bence Jones:—

We are unable to join the other members of the Commission in recommending the total stoppage of all movement of cattle in Great Britain. It is true that, if such a measure were practicable, it would be more effectual than any other in extirpating the disease. But we do not believe it to be practicable. It would involve an interference with the course of

trade at variance with our national habits; and it would demand sacrifices from large numbers of people, who are removed from the presence of the disease, and who will, therefore, not see the necessity for so stringent a measure. The sudden transformation of the enormous cattle trade, by which the large towns are supplied into a dead-meat trade, would involve difficulties and dangers of the most formidable kind. The foreign trade, which at this moment furnishes a considerable proportion of the meat consumed in the large towns, would also be seriously interfered with. The price of meat would, in consequence, rise materially and suddenly.

These difficulties would lead to the evasion of the prohibition; and if it is largely evaded, as we think probable, it will be worse than useless.

We prefer, therefore, the measures of a less stringent character, which are recommended as an alternative in the above Report. They demand no greater sacrifice than will readily be made to arrest the progress of so serious an evil; and, therefore, we believe that they are likely to be thoroughly carried out.

In the other recommendations of the Report we heartily concur.

SPENCER.	CLARE SEWELL READ.
CRANBORNE.	HENRY BENCE JONES.

We are of opinion, however, that store animals may be permitted to move from the farm of the seller to that of the buyer, provided they have a certificate from a justice of the peace acting in the district where the sale takes place, showing that they are free from disease, and that they have been located for a certain time on the farm of the seller.

SPENCER.	CLARE SEWELL READ.
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Oct. 31.

The following is a separate Report of Mr. Mc'Lean:—

I dissent from the Report on the following grounds:

I consider that the magnitude of the calamity against which it is intended to guard in no way justifies the interference with the traffic in cattle which the Commissioners in their Report recommend, and that the evils which would arise to the community from even a limited prohibition of the movement, or of the importation of foreign cattle, would far exceed the losses which may arise from the prevailing disorder.

By the last return issued by the Veterinary Department of the Privy Council-office—which, as regards the number of animals which have died of the cattle plague, is correct, and, although not strictly accurate in other respects, may be considered fairly to represent the progress and present extent of the ravages of the disease—it appears that up to the 21st of October, 1865, a period of rather more than four months from the time when the disease first appeared in Ialington, 14,083 animals had been attacked; that of these 6,711 had died, 5,119 had been slaughtered, 707 had recovered, and 1,546 remained under treatment.

The estimated number of horned cattle in Great Britain is about 7,000,000, so that less than one per 1,000 of such cattle have died of the disease in four months, or about one per day for every 116,000 head.

During the same period of four months, sound and healthy cattle, of the average value of (say) £15 15s. per head, have been imported from foreign countries at the average rate of 1,000 per day, so that by the operation of the present system, involving careful inspection at the ports of landing, the gain to the country has been 166 sound cattle for each one that has died of the disease.

The growing necessities of the community in the matter of animal food, and the comparatively trifling extent of the injury hitherto inflicted by the disease, do not justify any exceptional legislation or any systematic interference by Government with the trade in cattle, a trade which, taking its position among the other great branches of national industry, must be subject to its own peculiar risks and liabilities.

The existing Orders in Council, enforced by the exertions of landowners, farmers, and graziers who have embarked their capital in the trade, appear to be sufficient for its protection; while by insurance or otherwise the parties interested should



indemnify themselves against loss without appealing to the community to interfere for the preservation of their property by exceptional legislation.

Since the year 1750 the circumstances of the country and of the cattle trade have entirely changed, and no comparison can fairly be instituted between its state at that period and the present time.

In the year 1750, and the subsequent years of the cattle plague, the trade in cattle was one of the principal industries of the country, and any loss sustained by the owners was almost irremediable, as there were then no available means of importing cattle from foreign countries for supplying the people with animal food.

In 1864, circumstances were very different. In that year the computed net value of the articles imported into the United Kingdom was nearly £275,000,000, of which upwards of £40,000,000 was for alimentary supply, exclusive of spirits, wine, tobacco, and other excisable articles.

During the same year the computed net value of the articles exported was £212,658,542, making a total value of £487,520,468, while the amount of all descriptions of property and profits assessed to the income-tax was £326,775,501, about one-ninth of which was for occupation of land, and probably not so much as one-eighteenth was due to pastoral occupation.

The estimated value of property which it is proposed to protect by penal laws and quarantine regulations, to be carried out at the expense of the community and to their serious loss, inconvenience, and certain discontent, is about £60,000,000, or about one-eighth of the annual value of the national imports and exports.

The importance of the cattle trade, as compared with the other branches of national industry, is much less in 1864 than it was in the year 1750, while numbers of the people, their wealth, and means of purchasing animal food have greatly increased.

The consumption of animal food is not now confined exclusively to the wealthy, but it has become the necessary food for the working-classes, and the use of it is so general that so long as the disease can be discovered at a period when the flesh of the animal is perfectly good and fit for human food, it is impossible in this populous country for the disease to spread to any great extent, as all beasts showing the slightest symptoms of disease would be immediately slaughtered by the owner for his own protection.

As the demand, as shown by our imports of cattle, is greater than the home supply, there would only be partial loss when lean cattle had to be slaughtered.

The opinions expressed by witnesses of experience on the proposal to supply London exclusively with meat killed and brought from a distance were not favourable to the plan.

It is further to be considered that any prohibition to the importation of foreign cattle would affect and derange the whole of our commercial relations and means of communication with foreign countries.

It would create distrust at home and abroad as to the safety of investing capital in establishing, by steamboats and otherwise, cheap and regular routes by means of which food is provided for the community.

It would deprive the foreigner of an important exchangeable commodity, in many cases the only one he has to offer, and possibly lead foreign Governments to impose restrictions on the export of any food from their respective countries that might prove very detrimental to this kingdom.

The farmers of Great Britain cannot produce food enough for the people. Agricultural produce, including cattle, meat, utter, poultry, &c., to the value of more than £40,000,000 sterling has to be imported yearly from beyond the seas. Any legislation which should interfere with this supply, and the employment of the means which at great expense have been provided for its conveyance to this country, would inflict an incalculable amount of injury, and would occasion great and immediate suffering to the labouring classes, many of whom would be thrown out of work, while the price of provisions would be enhanced, and many of them now able to use animal food would be deprived of it. This would interfere with the value of labour, and with our means of competition with other countries by increasing the cost of our manufactures.

With these facts and considerations before me, and after carefully considering the nature and extent of the present dis-

order in cattle, I am of opinion that it does not at present justify any further restriction in the movement or trade of cattle, and that the powers now vested in Her Majesty's Privy Council are sufficient to prevent the spreading of the said disorder, and to avert any future outbreak of it.

Oct. 31.

JOHN ROBINSON M'CLEAN.

The following is a supplement to the Report:—

#### SANITARY RECOMMENDATIONS.\*

On the subject of preventive and medical treatment the Commissioners have received, both from this country and from abroad, discouraging but decided evidence that all methods hitherto adopted have been found unsuccessful. Nevertheless, being of opinion that medical science may still be able to discover agents capable of mitigating the virulence of the malady, the Commissioners have drawn up a scheme of investigation into the nature of the disease, and have intrusted different inquiries to scientific men of great skill and ability, who will make reports on the subjects intrusted to them at the earliest possible moment.

In the meantime a few sanitary suggestions may be offered, which are calculated to be useful to farmers and dealers in cattle. These may be divided into the following heads:—

I. The general precautions which should be taken by cattle owners to prevent the spread of the disorder.

II. The special precautions required when the plague is in the neighbourhood.

III. The measures, preventive and remedial, which should be taken when the plague breaks out in a locality.

IV. Measures for disinfecting sheds and cattle which have been infected.

#### I. GENERAL PRECAUTIONS TO PREVENT THE SPREAD OF THE DISORDER.

1. As no successful plan of treatment has yet been proposed, the owners of cattle must, in the meantime, rely chiefly upon those hygienic measures which the experience acquired in other diseases show to be important in preventing the spread of contagion, and in diminishing the intensity and area of an attack, when, in spite of such measures, they invade a locality hitherto uninfected. In the case of the cattle plague it is certain that no sanitary precautions can prevent the spread of the disease when it is actually introduced; still, from analogy, we may draw the conclusion that some effect may be produced on the rapidity of the spread or on the virulence of the disease, by placing cattle in the conditions most favourable to health.

2. With this view it is important to secure strict cleanliness, good drainage, efficient ventilation, and to prevent overcrowding in all cattle sheds and cowhouses. No accumulations of litter fouled by the voidings of animals should be permitted in, or even close to, the houses or sheds in which cattle are kept. Chloride of lime, carbolic acid, or the powder containing carbonate of lime and sulphite of lime should be used. The latter is probably the best; it contains a well-known disinfecting substance which is formed when sulphur is burnt, and also a strongly antiseptic material, kresote, from coal-tar. The sheds themselves should be swept and washed daily, and sprinkled with disinfectants. But such purification of the air of cattle-sheds or houses will be insufficient to preserve health if the cattle be overcrowded. Pure air and nourishing diet are of great importance in protecting animals from the attacks of disease. Pure water, derived from sources uncontaminated by drainage from surrounding dunghills, or from the absorption of vitiated air which hovers around them and in the sheds of cattle, is equally essential.

Every farmer should look to the housing of his cattle in the present emergency, as he would look to the housing of his own family, if cholera or other formidable disease were in his neighbourhood. Thorough cleanliness of the houses, good drainage, freedom from evil smells, nourishing diet, with pure air and water, cannot give immunity from the disease; but they may offer obstacles to its propagation.

\* Suggestions in the sense of many of these recommendations have been already drawn up by Professor Simonds and by Dr. Thudichum for the Privy Council, and have been circulated.

## II. SPECIAL PRECAUTIONS NECESSARY WHEN THE DISORDER IS IN THE NEIGHBOURHOOD.

Whenever the plague is known to be in the neighbourhood, or to be approaching it, the following conditions must be borne in mind:

1. The natural voidings of a diseased animal, as well as the discharges which come from its mouth, nose, and eyes, during the progress of the disorder, can be carried by men and animals, so as to infect sound cattle; and in this way the disease is often propagated. A farmer should therefore at once give orders that none of his own labourers should go near infected beasts, and that none of the labourers working on the farm where there are diseased cattle should approach his stock. Even when veterinary surgeons visit cattle affected with the plague, they should, if they have been with diseased beasts, first thoroughly cleanse their clothes, wash their hands in a solution of chloride of lime, and rub the soles of their shoes with disinfecting powder.

2. Both sheep and dogs can carry seeds of the disease, so that they should be carefully looked after, lest, in having access to diseased cattle, they may attach to themselves portions of excrement or discharges, and communicate the contagion to sound cattle. The farmer will do well to recollect that both sheep and goats take the plague in a virulent form, although they are not, perhaps, quite so susceptible to the influence of the contagion as horned cattle; but even when they do not take the disorder, the wool of the sheep and the hair of goats can long retain the morbid matter, and then transfer it to cattle.

3. The particles of the poison can be drifted by the wind to some distance, experience having shown that a space of considerably more than a hundred yards affords no protection. Therefore, if a farmer has the opportunity, he should remove his stock to the furthest possible distance from that of his infected neighbours.

4. If a farmer have reason to think that some of his beasts may have been near infected animals, he should at once wash them over with the solution of disinfecting soap or with a tepid solution of chloride of lime, carefully sponging out the nostrils and mouth, so as to remove all portions of discharges which may have been collected.

5. He should vigorously attend to the hygienic measures described in the last section.

## III. PREVENTIVE AND REMEDIAL RECOMMENDATIONS, WHEN THE PLAGUE HAS ATTACKED A LOCALITY.

1. Should, unfortunately, the plague reach the farm or cowshed, it will be the cattle-owner's duty to separate, without delay, the diseased from the sound stock. At once, and before any symptoms of the malady have appeared in the animals which may have been in contact with the diseased beast, he should place them in roomy, well-cleansed and dried, well-aired and disinfected sheds, having previously washed their bodies with water containing disinfecting soap, or with a tepid solution of chloride of lime. He will thus place them in the best condition to resist the further spread of the disease. But if he do not possess the necessary accommodation for the removal of the healthy animals, he ought, after separating the diseased beasts, to make a thorough disinfection of the house or shed, in the manner to be described afterwards, before he permits the sound stock to remain in it.

2. The sick beast, if allowed to remain alive, should be well rubbed down and thoroughly cleansed, be kept in a warm but well-ventilated and clean shed, and be covered with a clean horse-rug. The animal will thus be put in a favourable condition to receive such curative treatment as the veterinary surgeon or farmer may consider it expedient to employ.

3. Having failed to obtain any assurance of the existence of effective methods, the Commissioners only venture for the present to indicate some general suggestions as to diet and treatment, which may be useful to farmers.

a. Kind of Food.—One of the early symptoms of the disease is that the appetite fails and rumination ceases. When a dissection is made of an animal that has died of the plague, the stomachs are usually found to contain from one hundred to two hundred pounds of undigested food. This mass of matter interferes with the functions of nutrition in the case of new food, and, further, hinders the action of medicine which may be administered, by greatly retarding its absorption. As

soon, therefore, as the beast shows the early symptoms of the disease, its ordinary food should be changed; and, as rumination has stopped, the dry food should be replaced by warm liquid stimulating mash given in moderate quantity.

b. Warmth of the Air.—It is stated that the temperature of the air of the stall should be kept warm; probably not lower than 60 deg. Fahr.

c. Warmth to the Skin.—It is desirable to keep the skin of the animal as warm as possible, and, if it can be done, to promote perspiration. Without expressing any decided opinion as to the exact efficacy of steam or hot-air baths, we yet believe the evidence is sufficient to warrant a fair trial of these measures.

d. It is important to lose no time in beginning the treatment of the complaint with salines or diaphoretics, or even stimulants, according to the judgment of the veterinary surgeon as to the state of the disease. Every hour that is lost lessens the chance of a successful result. After cattle have been exposed to infection, some veterinary surgeons consider it useful to give saline and febrifuge medicines at once, even though it is not certain the animal has taken the disease.

e. When diarrhoea occurs, there seems little doubt that it should be controlled, and not encouraged.

f. The animal must be supported as much as possible by very nutritious food.

g. Milking cows should be regularly milked as long as any milk can be got. The milk, of course, should not be used as food.

The general diffusion of the disorder through the system leaves little hope that any local treatment is likely to prove effective.

When the animal shows signs of convalescence it should only be very gradually restored to the dry food requiring rumination. It may be treated with moderate stimulants and tonics, among which bark and iron are considered to be the most efficacious.

## IV. MEASURES FOR DISINFECTING INFECTED SHEDS AND CATTLE.

1. When animals attacked with the plague have become convalescent, they ought to be kept apart from sound beasts for three weeks, and even then not be permitted to associate with them till they have been washed and disinfected as described previously.

2. During all the time that animals suffer from the disease, the litter fouled by them, with the dung and discharge on it, should be burned, and not be allowed to mix with other manure. It contains the poison in a concentrated form, and it is questionable whether it can be disinfected efficiently.

3. The sheds in which the diseased animals have been must be thoroughly purified and disinfected. The roof and walls should be washed with lime. The floor and woodwork, after being thoroughly washed with water containing washing soda, should be again washed all over with solution of chloride of lime, containing 1 lb. to a pailful.

4. The hides and horns of animals which have died of the disease ought to be buried with the animal, according to the Orders in Council. But the hides and horns of those which have been killed to escape the spread of the infection must be dipped in, or thoroughly mopped all over, and, in the case of the hides, on both sides, with water containing 4 lb. of chloride of lime to three pailfuls of water. Unless this be done with care a most fertile source of contagion will be preserved.

5. The attendants upon diseased beasts should not be allowed to go near the sound animals in the same farm.

6. Every one who has had the plague in his premises should feel the responsibility which rests upon him to destroy, by careful cleansing and disinfection, every trace of the disorder which may be left on his pastures or stalls, or on his cattle, their horns, hides, manure, and litter. Under favourable circumstances for its preservation, the contagious poison has been kept, with all its virulence unimpaired, for many months. Unless therefore each person uses his utmost effort to extinguish the seeds of the plague which lurk about his farm, they may become a centre of contagion, which will again spread it abroad through the country, and render unavailable the sacrifice necessary for the speedy suppression of this terrible scourge.

## ARE SHEEP LIABLE TO CATTLE PLAGUE?

## THE VETERINARY SURGEONS AND THE PRACTICAL MEN.

At a numerous meeting of the members of the Wayland Agricultural Society, for the purpose of discussing "The nature and cause of the disease now prevailing amongst lambs, and whether or not such disease is analogous to the cattle plague,"

The Chairman, Mr. T. BARTON, said: They must all have been startled by the statement of Professor Simonds, which appeared on the 25th of September last. He, at any rate, was startled, because he thought that if it were true that their flocks were subject to the same disease as their herds, and would have to be banded over to the inspectors for wholesales—he was going to say indiscriminate—slaughter, the agricultural sun of England would be almost totally eclipsed. He hoped, however, for better things, and that the *rinderpest* would not be found to prevail amongst sheep; and though he saw in that day's papers reports that seemed to favour the idea that the disease among sheep was the same as among cattle, he was glad to say that the learned men who were investigating the subject asserted that it would never be so fatal among sheep as it was among cattle.

Mr. H. WOODS, who rose at the call of the Chairman, said, he had no doubt he had been called upon from the fact that he had taken some interest in the disease that was said to have existed at Crown Point. When first he saw Professor Simonds' letter in the *Times*, he was necessarily, like a great many others, somewhat alarmed, for he there learnt that there was a possibility of the disease being carried through their flocks, that agricultural distress would be very great, and that no one could tell where it would end. On the other hand, he felt that if the disease did not exist, people's minds were in such a state that a panic might arise, and no one could tell what would be the end of that. He, therefore, felt it a duty which he owed to himself and others entertaining these feelings, to make some enquiry as to the symptoms shown by Mr. Harvey's sheep. He did so, and was satisfied from what he was able to gather, that there were great doubts as to whether it was the cattle plague which existed among those sheep. He saw Mr. Harvey, and spoke to him on the subject, and Mr. Harvey, at his suggestion, decided to ask a deputation of practical men to meet Professor Simonds and Dr. Lethaby at Crown Point, and to take the opinion of the practical men on the state in which the sheep might be found. That deputation was composed of seven practical men, and they met at Crown Point; but, as he had said at a meeting held a short time ago, very much to their surprise, instead of simply meeting Professor Simonds and Dr. Lethaby, they found that they were to meet no less than seven professional gentlemen. Not that the practical men were in any way alarmed, because they felt, and strongly felt, confidence in being able to discuss those points that might come under their observation. He might say, to the credit of Mr. Harvey, that he did everything that lay in his power to give them all a fair and open field, and Mr. Harvey told him privately that he wished neither himself, nor his people, nor his management to be spared in any remarks it might be necessary to make, and as they would see from the remarks he (Mr. Woods) had made at Norwich, he had acted upon this permission. Mr. Harvey provided for them at Crown Point a very sumptuous luncheon, and while the professional gentlemen and the agricultural deputation were partaking of it he would ask the meeting to take a walk with him across Mr. Harvey's fields, and take a practical view of the state in which he found the lambs, and he would state the opinions enforced upon his mind by what he saw. He must confess that he was very much struck when he found that 2,000 sheep had been living together, folded together, and treated as one flock. If the management of practical men in this district, and he might say in every part of the county, was worth anything, the system adopted at Crown Point must have been wrong. There was a great quantity of coarse grass, such as he felt sure no practical man would think of feeding lambs upon, and he found also that a great many of the fields, which were divided by iron fences, where the animals lay, were covered with excrement, which he

had no doubt had lain there for a long time, and which, doubtless, created a very disagreeable effluvia that must have been perceptible to the organs of the lambs. There was another point with which he was particularly struck, and that was, that there was a long road divided from the fields by a wire fence, and that road appeared as if it was a receptacle for the lambs, which were probably taken there every day to be trimmed or otherwise treated, and if there happened to be a shower of rain, he felt certain that that road must have been nothing more nor less than a complete cesspool of excrement mixed with rain. He found, too, that those animals, during the early part of the summer, had been fed in the park where they were then feeding, and it must necessarily be imagined that the fields in which so large a number of lambs had lain were considerably soiled with their excrement. After the rains of August, Mr. Harvey said there was a great flush of vegetation—the grasses that had been dormant during the whole of the summer sprang up and produced a large amount of succulent food. He thought he need not ask any practical man in that room his experience as to the effect that succulent grasses from fields that had previously been heavily fed with sheep must have produced on lambs, for many of them had seen it, and they all knew that it must be highly injurious. It should also be understood that those animals had no artificial food given to them—they had nothing but what the park produced, and that, as he said, was of a very succulent character. There was no change of pasture, and no change of food. He thought, consequently, that those he was addressing would say, that even in what he had already stated there was quite sufficient to produce a disease similar to what many of them had seen in their flocks before. But there had come to his knowledge one important fact connected with the flock at Crown Point which had never yet appeared before the public, and having heard it incidentally it was only by considerable care that he was able to arrive at its truth. He must say to the honour of Mr. Harvey, that when the matter was put fairly to him he honestly told him that which he would relate to the meeting. They all knew that when lambs had been living on dry and bare pastures, when probably some feverish state of the system was produced, the very last thing thing they would think of doing would be to allow them an unlimited supply of water. Their experience told them that their great aim and object when their lambs in hot weather had been kept long without water was not to let them run to it indiscriminately, if they let them have it at all. But he had ascertained that during the hot month of August, and about a week or two before the disease broke out, Mr. Harvey's lambs broke away from the shepherd more than once or twice, and got down to the Thorpe river, where they not only drank the water, but rushed in, many of them going overhead, and a great many over their backs; the consequence being that they not only suffered from the effects of drinking the water, but also from the chill that must necessarily have been produced to the system by their immersion. But let the meeting listen to the account of the kind of water they had to drink. No doubt many of them had seen a leading article in the *Norwich Mercury* of last week, in which the editor said the fish had ceased to exist near Norwich, principally owing to the refuse of the alkali and other works, which rendered the water not only obnoxious but poisonous. As he (Mr. Woods) wished to state nothing but facts which he should be able to substantiate, he had taken very great care to obtain on every point he should speak upon evidence which he defied any one to contradict. He therefore wrote to a friend of his, whom, for obvious reasons, he should not name, though he would hand the name to the Chairman, and asked him the state of the river where the lambs had gone to drink. The answer he received was as follows:—

6th November, 1866.

My Dear Sir,—In reply to your letter I must tell you that the river near Crown Point is, in the summer months, very foul, and the stench sometimes is very bad for a mile lower

down the river. The surface of the water is sometimes covered with a thin coating of the refuse thrown into this river, which I have seen skimmed off to prevent the stench. There is no doubt but that the river water is bad enough to kill fish a very short distance from Crown Point, and must be injurious to sheep if they drink the water. It smells badly two miles past Crown Point. I have smelt it this summer quite to the Wood's End, which must be three miles down the stream. I believe this has been stated in the papers, and can be vouched for by any one living near the river in summer time.

He had also received from Mr. Harvey that morning a letter, from which the following was an extract:—

In reply to your note, it is very possible my lambs drank the river water, which has the sewage of Norwich emptied into it, as they were frequently by the river side, and it is true the river is sometimes so offensive it is difficult to be there without being sick.

He would ask those whom he was addressing whether as practical men they would think it right and judicious, whether they did not think it would produce consequences of which they would be very much afraid if they were to allow their flocks to drink such water as that? But it did not stop there, for he had ascertained as a fact that during three months the lambs frequently broke away to a small pond near Crown Point, which was nothing more nor less than a complete mass of animalcules, and whether this could be beneficial to lambs or not, his own experience was not sufficient to say, further than that he thought it must have been decidedly wrong to have let the lambs have that water. He now came to another point to which he must call attention. They would have read that at the meeting of Saturday week Mr. Forrester admitted that the treatment of the lambs was decidedly wrong, and such as no practical man would think of following without expecting that it would produce something like 15 or 20 per cent. of deaths under ordinary circumstances; but when he found the percentage came to 50 or 60 he held that there must have been something more than common, and that to all intents and purposes it must have been cattle plague, because so great a number of the lambs had died. Now, he joined issue with Mr. Forrester on this. He contended that the greater the number of sheep there were together the greater the loss they were liable to. To meet this point of Mr. Forrester's he would ask them to allow him to tell them that Mr. Palmer, of Foulmere, lost 55 lambs out of 107. Now, what he would ask was this: If Mr. Palmer had had 2,000 sheep in one lot instead of 107, what would have been the proportion he would have lost, the sheep having all the advantages of change and everything that could be given to them? But he had a still more startling point to bring to the consideration of the meeting in connexion with this part of the matter. His friend Mr. Palmer said he knew that a relative of his had unfortunately sustained considerable loss among his lambs, and Mr. Palmer kindly undertook to write for all the particulars, which he (Mr. Woods) had since received. The gentleman who wrote the letter he was about to read was a most excellent manager of lambs, and when they considered the loss, which was very great, with all his good management, he (Mr. Woods) had a right to ask what would have been the loss if that gentleman had had 2,000 sheep lying where only nine score lay on his farm? The letter was as follows:—

Weybread, 2nd November, 1885.

Dear Sir,—In answer to your letter respecting the disease, I can give you no satisfactory explanation. They were from a lot of nine score black-faced ewe flock lambs, good ones, costing 3s. each. When they first came home they fell down with foot disease, and got very poor. After the first rains in harvest they began to die. The first symptoms were dullness and scouring, and in about ten days they died. Their lungs and livers were entirely gone, but not in the way of rot. I lost 81, and 19 more dwindled away to skin price, thus making 100. The remaining four ewes are gradually getting better. The veterinarians and various persons who saw them thought the disease came from mildew and unhealthy state of the grass and layers. My opinion is that we cannot give lambs too much dry food or keep them too well. We have now several lots doing badly near here, but they are unhealthy ones. The strong lambs are doing well.

I am, dear sir, yours sincerely,

L. O. JEFFES.

To Mr. Thos. Palmer. If they found that Mr. Jeffes with all his good management lost 100 lambs out of 180, it showed that the loss at Crown Point was not so startling as to make it necessarily caused by cattle plague. Another point to which he wished to call attention was this. They knew that Mr. Forrester stated—and he

was quite sure that Mr. Forrester stated it believing it to be true, because he believed Mr. Forrester incapable of saying anything but what he believed—that the sheep began to die soon after the bullocks. Now, he (Mr. Woods) had it on the strongest possible evidence, and that was from Mr. Harvey himself, in his own handwriting, that eleven lambs sickened and died before a single bullock was taken ill. He would give them another case. There was a flock in Monmouthshire—in fact there were eight flocks in Monmouthshire, of which he would presently give particulars—in which a gentleman lost 50 lambs out of 130. Therefore they saw that the losing of 60 per cent. at Mr. Harvey's was not so very startling as Mr. Forrester seemed to think. There was another point to which he wished to call attention, and that was as to the time during the past summer when the disease broke out among the sheep in various parts of the country; and he wished them to give particular attention to this, because he thought they would find that the disease broke out in Norfolk and other counties almost simultaneously, the outbreaks being within a week or so of each other. From particulars furnished by Mr. W. Nelmes, of Pembroke Castle, Monmouthshire, he found that the disease broke out in two flocks in Monmouthshire at the latter end of July and in the first week of August, and there were four other flocks in the same county where the disease appeared among the sheep, and at that time there had not been a single case of cattle plague either in that county or the adjoining county. In three flocks the disease commenced at the end of August, and in another it broke out during the first week in September. The disease commenced among the flock of Mr. Palmer, of Foulmere, in August; among the sheep of Mr. Lint, of Shelford-hall, Essex, in the first week of September; among those of Mr. Pitts, of Starston, on the 3rd September; among the sheep of Mr. Robinson, of Oakley-hall, Bishop Stortford, on the 1st September; among the sheep of Mr. Palmer, of Tottington, on the 3rd September; and among the sheep of Mr. Garne, of Bushy-grove, near Watford, on the 8th September. Therefore they would see that the disease in the flocks he had named, and doubtless in others, broke out pretty nearly within ten days of each other. He would now ask them to listen attentively while he read a description of the appearance of the disease among the Crown Point sheep, as stated by Dr. Letheby in his letter to the *Times* of the 27th September. He wished attention to be paid to this because he should read other people's descriptions of the symptoms among their lambs, and ask them whether they did not see a strong similarity. Dr. Letheby said:—

The symptoms which I observed during my visit to-day were the following:—The animal appears at first to be somewhat feeble in its gait; it also looks heavy, and stands with drooping head and ears; its appetite fails, and it shows signs of severe febrile action by the heat of the head and ears, and by its seeking the shade and running to the water to drink. At this time a discharge begins to flow from the eyes and nose—the discharge being very limpid and colourless like water, not purulent, although there are occasional patches of ulceration about the nose from the irritation of flies. There is some difficulty of breathing, and the respiration is panting, and the animal moans as if in pain. Diarrhoea also occurs, but the discharge is never tinged with blood, as in the case of cattle, but is of a thin gruel-like consistence, and is of a pale greenish-yellow colour.

The next description of the symptoms he should read was that given by Mr. Pitts, of Starston:—

Dullness and drooping, loss of appetite, appearance of pain, coughing, sinking of flesh, discharge from the eyes and nose, and thin flux.

Mr. Robinson, of Oakley-hall, near Bishop Stortford, described the symptoms thus:—

Deadness of coat, loss of appetite, hanging down the head and ears, extreme weakness, excessive thirst, and scouring. Mr. Nelmes described the symptoms among the eight flocks in Monmouthshire as follows:—

Refusal of food, drooping ears, dull appearance, violent discharge from the nose, shortness of breath, rapid sinking of flesh, scouring, and appearance of pain; coughing, the more violent when disturbed.

In a letter he had received from Mr. Nelmes, that gentleman described the *post mortem* appearances of the lambs. The letter was as follows:—

Pembroke Castle, Nov. 3rd, 1885.

Sir,—I have very great pleasure in replying to yours of the 31st inst. The greatest number of lambs that have died in our flock is 53 out of a flock of 143. Feeling an unusual inter-

rest in this disease, I have been present when several that have died have been opened in different flocks, and I may say in each case there has been congestion of the lungs, also a parting of the coats of the stomach in patches, and sometimes there are spots. I was one day speaking to a professional about these spots. He says it is not unusual to find them where there is congestion of the lungs.—I am sir, yours truly, Mr. Woods. W. K. NALMS.

Mr. Garne, the very highly intelligent agent of Mr. Marchbanks, of Bushy Grove, near Watford, in Hertfordshire, described the symptoms as follows:—

The ears drawn back and head down; if moved, begins coughing, and shows weakness of loins by staggering gait; refuses food, sets up its back, and shows appearance of pain, scours a thin greenish-yellow coloured excrement. In some there is no scouring, and these generally prove the worst cases, and die quicker after being taken. When dead the lungs are congested, the liver decayed, and intestines inflamed. The disease may be discovered by examining the eyes of the affected lambs, which are somewhat similar to those of sheep with flukes in the liver.

Another description came from a man who was well known to those present by repute—he referred to Mr. Lugar, of Hengrave, who said, under date Nov. 7th:—

I will now answer your letter of yesterday. My lambs were taken ill, or rather showed symptoms in the beginning of September. The first was a cough, or husking, which ended in violent coughing. They then had discharge, which sometimes lasted two days, and then ceased, and then returned a second time. The lambs wasted every day, and looked very thin. Those that died did not scour—also wasted very much. I believe it to be the same kind of disease that we have had at times for several years, and many thousands have died from its effects.

He had received several other descriptions of a similar character. He wished the meeting to refer to the county papers of last Saturday week for the description given thirty years by Mr. Youatt of the symptoms shown by lambs with inflammation of the lungs, and they would find that it corresponded in almost every particular with the description given by Dr. Letheby, as noticed in Mr. Harvey's sheep, and, with some little difference—allowing for each gentleman's powers of description—with the symptoms shown by each of the flocks of sheep to which he had just referred. This testimony showed clearly enough that the disease of which he was speaking had been a recognised disease thirty years ago, the symptoms then being the same as now. They should understand that all these returns he had received before he went to Crown Point, as he wished to be perfectly prepared with evidence to meet the scientific gentlemen. There was another point on which he had been twitted more than once at the Norwich meetings, and that was as to whether or not the disease was a curable one. He would say advisedly that the disease at Crown Point was a curable disease if taken in time, and he would corroborate this by practical facts. He would ask the question of Mr. Palmer (of Foulmery), Mr. Palmer (of Tottington), Mr. Pitts (of Starston), Mr. Garne (of Bushy Grove, Watford), and Mr. Lugar (of Hengrave), and they would say that they had cured lambs with precisely the same symptoms as those at Crown Point. He would now return to the learned professors and agricultural gentlemen whom he had left at luncheon with Mr. Harvey, and proceed with them to the *post mortem* examination of the dead lambs, a considerable number of which lay about. Several of the professional gentlemen—he did not say with what object, that was best known to themselves—selected those cases which they considered the worst. Perhaps they were right, as they wanted, no doubt, to give clear and undeniable evidence of what they expected to find. It was much to the credit of Mr. Smith, the veterinary inspector of Norwich, whose conduct throughout had been uniformly straightforward and honest, and that of a man who had an opinion of his own, and was determined to maintain it, that he had stated when the dead lambs were about to be opened, if the lungs were healthy he should say it was cattle plague; but if, on the contrary, they were congested he should have very considerable doubt whether it was cattle plague or not. This opinion was borne out by a great authority, Dr. Smart, who, in his report to the Council of Edinburgh, the other day, made the following remark:—

The "staring hide" and "arched back," so frequently mentioned as distinctive features of this disease, while characteristic of the advanced form of pleuro-pneumonia, are not at all marks of the "rinderpest." There is no cough or

lung symptom in the pure and uncomplicated examples of the disease.

Consequently, with so great an authority behind him, Mr. Smith was not so far wrong as some professional gentlemen were willing to make it appear. He wished to call particular attention to the fact that in pure cases of *rinderpest* the lungs were as healthy as they could be. But even if they found a few cases where the lungs were diseased, was this at all surprising, when they considered that there was still a great amount of lung disease in this country? But, singularly enough, he had never yet met with a gentleman who, on *post mortem* examination of bullocks that had died from the *rinderpest*, had found any lung disease at all. Mr. Brasnett, of Croxton, had seven bullocks taken ill the other day, and they were slaughtered, and the veterinary inspector said the lungs were healthy and the stomach was not spotted. Now, with respect to the *post mortem* appearances, in the lambs at Crown Point, there was nothing particularly remarkable in the first two or three cases. There was great inflammation of the viscera, extreme congestion of the lungs, and the livers were diseased. As to the lungs, they were what in medical phraseology were termed hepatized, which meant that they would readily sink in water. It should be understood that there were two or three cute shepherds there, and they had, on their own account, opened one or two lambs, and there saw distinct spots, which the learned professors afterwards made so great a matter of; but they only saw what they were prepared to swear they had seen in sheep many years ago. During the *post mortem* examination, the very intelligent shepherd of Mr. Rising, at his (Mr. Woods') suggestion, went and dug a lamb up from a pit, and he (Mr. Woods) called the attention of the professors and the medical gentlemen to the state of the stomach. When they examined the lining of the fourth stomach they found it spotted. This settled it in the minds of those gentlemen as being conclusive that the sheep had died of cattle plague. The practical gentlemen were inclined to have produced evidence, and to discuss, not only the question of the *post mortem* appearances, but as to what was the general condition of the sheep; but from some cause or other, best known to the other gentlemen, they declined, and thus ended the meeting at Crown Point. The great point that was made as to any significant and marked proof of the lambs having had the *rinderpest* was, so far as he could see, that they had those spots on the fourth stomach. There was not one lamb examined after death at Crown Point but its lungs were more congested than he had ever previously noticed to be the case either in sheep or other animals, and the lungs of the animal that had the spotted stomach were more congested than those of either of the other animals. If, therefore, it was a feature that cattle with the *rinderpest* had healthy lungs, assuming that the sheep also had *rinderpest*, it was a direct reverse of that feature to find that they had unhealthy lungs. They had been told lately that the lungs of hoggets were more susceptible of disease than those of beasts. But was this the fact? He asked those whom he addressed, as practical men, to say whether they had not seen and heard, in their experience, of 25 per cent. more cases of lung disease in cattle than in sheep? It was a strange and startling fact, that in the two days following the meeting at Crown Point, Mr. Rising had a sheep taken with a disease the symptoms of which were similar to those observed at Crown Point. Mr. Smith examined the carcass of that sheep, and found unmistakable evidence of those spots on the stomach; and yet there was no cattle plague on Mr. Rising's farm, nor had any been known to be in the neighbourhood. Consequently, if that sheep had the cattle plague, the cattle plague must be an epidemic, because the disease was not taken by infection or contagion. He would now read what Dr. Letheby said was the immediate cause of the death of Mr. Harvey's sheep:

The immediate cause of death in the sheep is extreme congestion of the lungs, amounting in many cases to hepatization. This is a constant *post mortem* sign in the sheep, and is rarely or never seen in the cattle plague.

On the same Saturday that Mr. Rising had described his sheep to him (Mr. Woods), Mr. Farrer, of Spole, said he had had a lamb die, and described the symptoms as similar to those at Crown Point. Mr. Farrer said he found the fourth stomach spotted like a plum pudding with the so-called plague spots; and yet there was no cattle plague on Mr. Farrer's farm. Two or three days afterwards he (Mr. Woods) went to Mr. Lindsey's, of

Stanford, and there saw two dead lambs that Mr. Lindsey's shepherd had opened an hour or two before, and in them he saw stronger manifestations of the so-called cattle plague than he had seen at Crown Point—the stomachs being more spotted, and showing altogether stronger symptoms. The shepherd afterwards told him that a day or two later he opened another, the fourth stomach of which was even more spotted and marked than those of the animals he (Mr. Woods) had seen. He also had a sheep sent from Mrs. Howes' farm, at Blakeney, and it was opened in the presence of two medical gentlemen of Watton. In it they found the hepatized lungs and the inflamed viscera, but there was an absence of the spots in the stomach, and he would declare upon his honour that the internal lining of the fourth stomach was precisely in every particular like that of the sheep he had seen opened that had been inoculated by Mr. Wells. There had been no cattle plague near Mrs. Howes' farm. They opened another lamb, belonging to Mr. John Gasken, of Tompeon, in the presence of Lord Walsingham, and found some gangrenous matter round the throat, and on the fourth stomach, two clear and distinct spots like cattle plague, and so deep as to have actually eaten into the submucous coat of the fourth stomach. The lungs of the animal were also much congested and the viscera very much inflamed. But the most striking case he had to call attention to was one from Mr. Back's, of Saham. The lamb was sent to Mr. Worms' veterinary establishment last Wednesday, and Mr. Worms had invited him to go and look at it. He went, and found that it had evidently been slinking, and there were the drooping ears, arched back, moving flanks, appearance of great pain, and discharge from the nose. He (Mr. Woods) said it would die, and it died on the following day. Mr. Worms sent him word that if he liked to call on Thursday afternoon he could see the sheep opened. He accordingly attended, and they had a *post mortem* examination, and that sheep had points of disease more strongly developed than any sheep he had seen at Crown Point, more than ever confirming his opinion that there was no cattle plague in sheep. The sheep was opened shortly after death, and the appearances were these: Great inflammation round the root of the tongue, the larynx much inflamed, and also the windpipe. The internal lining of the gullet was very much ulcerated with deep-seated ulcers, some so deep as to penetrate through the lining of the gullet, and these extended, more or less, down to the rumen, or paunch. The parts not ulcerated were of a gangrenous purple colour. The heart was much inflamed and blocked up with coagula. There was great inflammation of the viscera; effusion of blood into the cellular tissue of the sub-mucous coat of the fourth stomach, forming livid patches, which in medical language was called ecchymoses, which he had never seen in any sheep of Mr. Harvey's; and a clear and distinct livid patch in the duodenum, or first intestine. This brought him down to the examination of the points connected with another flock of sheep that had been mentioned in the reports—those of Mr. Temple at Blakeney. He had not seen the sheep, but he had taken pains to make inquiry about them, and had been informed that they were bought at Colchester by Mr. Page and sent to Thetford fair, but he had not learnt whether they were sent by rail or driven, though he was led to believe they were driven, more or less. Thetford fair was in the middle of August. The sheep were sold to Mr. Stannard, who sold them to Mr. Patterson, and Mr. Patterson sent them to Mr. Temple. If those animals had been drifted some distance before they got to Thetford fair, and they stood that fair on a hot, dry day in the middle of August (Thetford, in dry weather, being a very dusty place), and if they were then sent off by rail, without any refreshment or water, to Fakenham, and then driven from Fakenham down to Blakeney, he would ask any practical man whether there were not fair and reasonable grounds for supposing that those sheep might have suffered to some extent from the drifting and the great exertions they had consequently to undergo? He knew that Mr. John Matthews, of Stanford, had seen those sheep, and he consequently wrote to Mr. Matthews, asking him what was his opinion of them, taking a farmer's view, and Mr. Matthews replied as follows:

Stanford, 4th October, 1885.

DEAR SIR,—In reply to your letter to-day, I beg to say I saw Mr. Temple's lambs on Monday, the 17th September. My opinion then was, and I have seen nothing to alter it since, that the symptoms they exhibited were precisely like those exhibited by lambs in my own neighbourhood, with

this exception—that they were aggravated by drift and exposure to sun and dust for several days, with insufficient feed. In answer to your second question, whether the symptoms materially differ from cases I have seen other years, I beg to say (with the exception named) that the symptoms were those of 60 lambs I lost from a lot of 240 ten years since. I have seen since, at different periods, lambs similarly afflicted, and the loss probably would have been as heavy had they not been favoured with seasonable weather.

I remain yours very obediently,

H. Woods, Esq., Merton.

JNO. MATTHEWS.

How frequently did people become alarmed at the name of the cattle plague! It was becoming popular to call every disease that happened to animals the cattle plague, and much alarm was often felt about it. He had that morning received a letter from Mr. Lugar, in which that gentleman mentioned a case worthy of attention. The letter was dated November 7th, and he would read the following extract from it:

I wish to mention a case which has just occurred at Lackford, about three miles from Hengrave. The proprietor, who farms some of his own estate, sent his man up to ask me what was to be done, for his *breeding ewes* were dying fast—they had lost eleven, and several others were ill. This came on so suddenly they could not think what it could be, for they were dead in a few hours. I sent the cattle inspector over, who ordered three to be killed, and said it was the nearest appearance to the plague of anything he had seen. The sheep appeared blown and in great pain; and, when opened, the intestines, &c., were one mass of inflammation. However, I advised them to make a complete change in their food. The last account is they are better, and no more dead—truth it was from putting them on to very young grass or low meadows, and then on to *Swedish turnips* very full of growth, and having too many to begin with, for it appears that it is not the plague, and change of diet has worked a cure.

Now, if the owner of those sheep had not met with so sensible a man as Mr. Lugar, it would have been said, "a case of cattle plague has occurred at Lackford among old sheep," and the practical men would have been swamped by the remark that the disease had hitherto been confined to lambs, but was now shown to have attacked old sheep. He had that morning received from Professor Gamgee a letter, in which he said:—

Lambs have died in large quantities this year of parasitic lung disease, and near Rotherham (in Yorkshire) it was supposed that the cattle plague had attacked the lambs, and I found on examination that such was not the case.

This brought him to the trials at Crown Point. After the *post mortem* examinations, some objections being taken by practical men to the conclusions arrived at by the medical gentlemen, it was determined that there should be a trial of sheep at Crown Point, and he believed it was decided at a meeting of the Cattle Plague Association that there should be forty sheep taken from what were considered the best of Mr. Harvey's lot, though he was sure he should be borne out in saying that when the sheep's eyes were turned so that the whites of them could be seen, they bore all the appearance that was described in Mr. Garne's letter. When they wanted out of that lot to find a healthy lamb to make an experiment upon for the satisfaction of the professors, they confessed they could not find one. This showed that the whole of them were more or less in an unhealthy state. Twenty were to be taken from animals said to be convalescent; twenty-two were to be taken which were nearly dead, and twenty more to be bought, and if he was right they were to be good, strong, healthy, well-fed lambs, and there were to be ten of Mr. Read's shearlings. The selection of the convalescent lambs led to some dispute between Mr. Rising and Mr. Wells. The twenty from Sir Thos. Beauchamp's flock that were to have been good, strong, healthy lambs, were light, delicate animals, and two of them he would swear were not healthy. Mr. Harvey's and Mr. Rising's shepherds reported that when they took the twenty off the wagon they said they were a poor lot to begin with, and one that lagged behind as they were taking the lot to the field of trial, they observed not to be healthy. Now, without desiring to cast any reflection on any individual, he must say that where there was a shadow of doubt the doubt ought to have been removed—and the instructions of the committee of the Cattle Plague Association ought to have been literally carried out. Therefore, those twenty lambs ought to have been strong, healthy animals.

A VOICE: What was the cost of those lambs?

MR. WOODS said they ought not to have cost much by the look of them. This brought him to another point to which

he must call attention. They had all seen a letter of Mr. Wells in the Norwich papers of last Saturday, and Mr. Wells evidently felt aggrieved at some remarks he (Mr. Woods) made on the previous Saturday at the meeting of the Cattle Plague Association. He was willing to admit that he made those remarks in the heat of the moment upon some information he had received which he was willing to believe was misrepresented, and consequently if Mr. Wells felt that he had said one word that was painful or offensive to him, or language that one honest man ought not to use towards another, he had great pleasure in withdrawing such remarks. He could not charge Mr. Wells with anything like unfair conduct, because in a letter he had received that day from a gentleman in whose opinion he had considerable confidence the writer said he believed Mr. Wells had treated the whole matter fairly. But while admitting this and believing that Mr. Wells did not wish to misrepresent facts, he was sure Mr. Wells would allow him to say that he (Mr. Wells) was liable, like other persons, to make mistakes. Mr. Wells said in his letter that the sheep on trial did not succeed so well as was expected under the management of Messrs. Woods and Rising. If the Woods there alluded to was himself he would tell Mr. Wells that he had had no more to do with the selection of those sheep nor with the management of them than the King of Abyssinia. Had they been under his treatment they would not have been treated as they had been. In placing those sheep with others on trial it ought to have been the first object to prevent them dying from any other complaint than that which they were placed there to take, if they could take it. He did not mean the slightest reflection on Mr. Rising, who had done everything a man could do, and he must say that if Mr. Rising had erred at all, it had been in endeavouring to so carry out his management that the sheep should have the plague, if they could get it, Mr. Rising having felt as strongly as he (Mr. Woods) had done that they would not take it. Mr. Rising therefore honestly and fairly desired not to leave a single point with which those who were opposed to him could find fault. Let them now see what the treatment of these sheep had been? Mr. Harvey's sheep were taken from grass land, they had been running on a wide space; and Sir Thomas Beauchamp's sheep—and he had this from Sir Thomas Beauchamp's agent—had been running in his park, and on new layers. Those sheep were placed in a small fold upon black land, and young growing turnips were given them to eat. They were not allowed to run out as flockmasters were in the habit of letting their sheep do when the lambs were put on turnips. He believed all flockmasters trained the lambs to eat turnips for three weeks or a month before they regularly put them on that food, for fear they would be killed outright if put on turnips all at once. Then, the turnips given to the sheep were such that he was quite sure they would kill any lot of sheep. He would read a letter he had received from Mr. Rising yesterday morning, in which Mr. Rising sent him a statement of the trials:—

Cossey Lodge, Norwich, Nov. 6th, 1865.

DEAR SIR,—I beg to forward you a statement of the trial of the sheep at Crown Point, which commenced on the 10th of October last. I selected forty lambs off the Park. Mr. Wells selected forty of the very worst that could be found, twenty were brought from Sir Thos. Beauchamp's, and five shearlings from Mr. Read's—the whole of these were put in rather close fold, as the main object in the trial was to prove if the disease could be conveyed to the healthy animals. I must tell you we started unfairly, as there were no troughs for the first five days; this, of course, was against such weakly sheep, and I had to feed them on miserably small turnips, full of growth (the worst thing you can give to sheep); but in spite of all this, I think the trial has been a successful one, as the following account will show. We have now living (with the exception of one likely to die, and I expect will live), 75 per cent. of the forty selected by me; over 50 per cent of Mr. Wells' lot, 85 per cent. of Sir T. Beauchamp's, and all the shearlings, notwithstanding Mr. Overman stating that one of them had the disease, but that my medicine cured it (so much for Rising's patent). I ought to state that six died the first night (of course they were dying when selected). The numbers as they died were as follow: First week, twenty-two; second week, six; third week, three; fourth week, two; and, with the exception of the one before mentioned, all the others are likely to live and are doing remarkably well. Trusting I have sent a clear account,

I am, dear sir, yours truly,

HENRY WOODS, ESQ. ROSS. C. RISING.

Mr. Harvey also expressed his view as to the way the sheep

were treated. In a letter dated the 7th November, he said:—

The sheep are now doing well: some days I do not lose one, and others I do, according to the change of temperature, I think the fault in Mr. Rising's management was that he began before he had his materials together, troughs and proper food, and no doubt at first was the principal loss. Again he imprisoned in a small pen lambs which never saw a turnip before, which prevented many eating the food provided until actual hunger and consequent debility had ensued, while the very ill died without making the exertion.

Consequently the meeting must feel, as practical men, that the trial was not only a trial whether the animals would take the disease, but a strong trial as to whether or not they would live under such treatment. The result which he had received up to that morning was as follows: From Mr. Harvey's best lot of forty, twelve had died; from the twenty said to be convalescent, seven had died; from twenty-two nearly dead, thirteen had died; from the twenty of Sir Thos. Beauchamp's, three had died; and the ten shearlings of Mr. Read's were all well. The two last named lots had been with the affected animals since the 10th of October, and only three of Sir Thos. Beauchamp's had died; while the whole of Mr. Read's shearlings—the five that were put in the field with the infected animals, and the five that were put in the park with the infected animals—were all living and doing well. When he went to Crown Point to look at the lambs that day fortnight, he found that one of Sir Thos. Beauchamp's had died, and therefore he felt it important to make a superficial examination of the state of the animal. He found that it only weighed 4 stone 3 lbs. as it lay; it had not an atom of flesh on its bones; and its wool came off with the slightest pull, and any practical man knew that if the animal had been anything like healthy for weeks before, its wool would not have come off so easily. He went to Norwich, and learning that there was to be a committee of medical gentlemen to meet Mr. Wells and Mr. Smith and make a *post-mortem* examination of that animal and of the animal that was said to have died from inoculation, he felt it his duty to be present and see what took place. He was present, and he would say that the *post-mortem* appearances of Sir T. Beauchamp's lamb were these: It had consolidated lungs, terrible inflammation of the viscera, great emaciation of form, and there were clear and evident specks of what were called the cattle plague; but when they came to look into it it was admitted by the medical gentlemen on all hands that it was a diseased animal when it went to Crown Point, and had not died of cattle plague. Let them look, then, at the sequel. If the sheep did not die from cattle plague, what could the medical gentlemen say about the spots with which the fourth stomach was covered, and which were like the spots found in the animals they said had died of cattle plague, at Crown Point? With regard to the sheep that had been inoculated, the *post-mortem* appearances were similar in some respects to those of the other animal, except that there was an absence of any spot on the fourth stomach. The mucous lining of the stomach was certainly thicker, but there were no spots; and when he called attention to the surface of the skin of the animal, which showed no manifestation of having taken the plague, one gentleman turned round—he would not mention the name, because it appeared to be dangerous to give names—and said "Then it must have been taken by contagion." They had been asked there to see the inoculated sheep opened; but had it died from inoculation? He had no hesitation in saying it had not. He now came to the report sent in by the medical gentlemen to the Cattle Plague Association, and he wished to speak with the most marked respect of those gentlemen, who he believed went to Crown Point and did everything they could to arrive at a right and proper conclusion; but it was no disrespect to them to say that a man unaccustomed to the *post-mortem* examination of sheep could form but a very inadequate opinion of the appearances presented. He saw a *post-mortem* examination of a sheep made in the presence of a surgeon of great skill, whose impression was that the lungs were healthy, while the impression of practical men was that they were not healthy, and when the lungs of a healthy sheep were exhibited the medical gentleman acknowledged that he was in error. Was it not possible then that the gentlemen who had sent in the report he was about to read might also make mistakes; was it possible that without great practical experience they could distinguish between animals that were healthy and animals that were slightly affected? Their report was as follows:—



To the Chairman of the Norfolk Cattle Plague Association.  
 Sir,—Your committee, in carrying out the instructions given to them, have made experiments as time and opportunities have allowed. Some of these experiments are concluded, others are still in progress; but, so far as they have gone, your committee are able to report—1st, that the disease is communicable by inoculation from bullock to bullock; and 2nd, that the disease is communicable from bullocks to sheep by association. We are, sir, your obedient servants,  
 W. P. NICHOLLS,                      PETER EADE, M.D.,  
 WM. CADGE,                      THOS. WELLS, M.R.C.V.S.,  
 FRED. BATEMAN, M.D.,      WM. SMITH, M.R.C.V.S.  
 Norwich, Nov. 1, 1866.

Of course no one doubted that the disease was communicable from bullock to bullock by inoculation; but the question was as to its being communicable from bullocks to sheep by inoculation. Where was the report of the medical gentlemen on the inoculated sheep? It was not noticed in the report, which was the first those gentlemen had given to the public. Had they ignored the inoculation altogether, or was it in progress? This was a question which practical men wished to have answered. Mr. Forrester, in reading that report, had said the facts in it were few but weighty; but what proof did they give of the assertion that sheep had died from association with bullocks? Mr. Forrester had said that Mr. George's ewe that had died was a four-year-old, and that it had caught the disease from being associated with Mr. George's bullocks; but in a letter to him (Mr. Woods) Mr. Smith stated that the ewe was five years old. He should like to have looked into her mouth, because when they got to four or five years old the marks were so indefinite that it was difficult to say whether an ewe was four or five, or even eight years old. What age, then, was the ewe? What was her condition when put with the bullocks, and did she not die from inflammation of the lungs, caught through the late rains? He would give an instance. About the same time that animal died, a ram that took the first prize and the cup at the Norfolk Agricultural Show, and the third prize at the show of the Royal Society, was taken with as strong an attack of inflammation as he ever saw; he was four days between life and death, and everybody felt sure he would die, but by the strong and active measures taken with him he was now alive and doing well. It was natural that on the *post mortem* examination of the ewe he had mentioned the congestion of the lungs was not so strongly marked as in the case of the lambs. Mr. Forrester went on to tell them in his speech that one very strong lamb of the trial lot at Crown Point jumped the hurdles and helped himself to the turnips. If he did so, the fact of his eating those strong turnips on the black land was sufficient to account for his death—such turnip tops as he saw in the field were sufficient to kill any lamb. He would now give them some very strong and positive evidence in direct contradiction to what the medical committee had set forth. Professor McCaul, in a report to the Town Council of Glasgow, after speaking of the diseased cattle, said—

I have also had five ordinary sheep—viz., two ewes and three lambs—and one African ewe sheep, in constant contact with cattle suffering under plague in its most severe form. They have been confined in the same boxes and eaten of the same food since Thursday, the 28th ult., and I also inoculated with the discharge from the eyes and nostrils of plague-stricken animals the African ewe and one of the lambs in the beginning of the week. None of them have shown any symptoms of disease. I have also kept five dogs—viz., a Scotch terrier, two retrievers, a pointer, and a mongrel—at the sanitarium, and fed them almost entirely on the stomachs and intestines of cattle which have died from plague, selecting those portions which are most virulently affected. They have continued feeding on this since Monday, the 18th, and no symptoms of disease of any kind have shown themselves. That morning he had received the following letter from Mr. Nelmcs:—

Pembridge Castle, Nov. 3rd. 1866.  
 Sir,—Since I wrote my first letter of to-day I have seen a veterinary surgeon; he is a person who has a considerable sheep practice, and has paid very great attention to the lamb disease for years; he says he has had as many as 3,000 at one time under his care, and the only difference this year to others is, he has found the disease of a more stubborn nature. He has been to Edinburgh (of which college he is a member), where he stayed a week, during which time he was fully employed investigating the disease—namely, the cattle plague, and dissecting animals that had died from the plague; he examined the sheep that have been in the sanitarium for weeks, living with diseased beasts and feeding with them, even eating the hay with the saliva of these beasts upon it, and he pronounced them healthy. I asked him his opinion, it he

thought this lamb disease partook in any way of the cattle plague; his reply was, not in the least. It was the same disease that has been so prevalent in this part of the country for years, but more severe in its nature this year than he ever found it before. He had the accounts of the Norfolk flock, and he says he is satisfied that it is the same disease that has been raging in this quarter, and quite laughs at the idea of the professors; but as he did not wish me in any way to make use of his name because he is also a member of the R.V.C., I therefore promised him it should not appear. I think he will give me his assistance if you should require any further information. I am, sir, yours truly,  
 Mr. Woods.                      WM. NELMES.

They thus had evidence that in Glasgow, where the sheep had been placed with infected cattle, and had been inoculated, they did not take the disease; and in the Edinburgh sanitarium sheep placed with infected cattle had also resisted the disease, as was confirmed by a member of that college. He would now read another letter he had received that morning from Mr. Garne, and though it took rather a different line it was well worthy of attention. It was as follows:—

Bushey Grove Farm, Watford.  
 Dear Sir,—I beg to inform you that from the birth of Mr. Marjoribank's lambs to the time of their being attacked they had been particularly healthy, having lost only one per cent. Just previous to their being attacked we had very heavy rain during the evening, the pastures being covered with what is commonly called cobweb, and the air being as it were full of it. In a few days the grass fields were covered with a peculiar kind of blight, which collected on the shoes similar to a fine powder of a pale chocolate colour; the clovers were covered with mildew. I remarked to the shepherd how unhealthy the pastures were, remembering having heard my father (who is an experienced stock manager) say that such was very injurious, and often produced husk in young calves. Soon after this the lambs showed the symptoms I have described to you. I believe the sheep disease has no connection with the cattle disease, and for the following very good reason:—At the time I had several lambs ill (with what, to all appearance, has been called in Norfolk cattle plague) I put them in a close, and soon after having two cows calve, I turned them into the field with the lambs for a few hours every day, and they (the cows) took no harm.

If a beast could communicate the disease to sheep, it was far to suppose that the sheep could communicate it to beasts, but here was evidence that they could not do so. He had another letter, which he considered an important one, because it gave facts near home. It was written by Mr. Fulcher, bailiff to Lord Sondes, and was as follows:

We have had several cases of plague in this neighbourhood. In most instances the diseased cattle have been herded with sheep, yet the latter have always escaped. Mr. Dack, of Guist, three miles from this place, who lost ten bullocks of *rinderpest*, informs me that at the time the beasts became diseased they were grazing in the same pasture with his ewes. The present cattle plague is, I believe, admitted to be identical with that which prevailed in the last century; and I look upon it as a remarkable and, to flockmasters of the present day, cheering circumstance, that all the old records of the disease mention it as affecting neat cattle only.

He would now turn to Mr. Harvey, who, they learnt, had 650 sheep left that were doing well, but that was chiefly because Mr. Harvey had an intelligent shepherd, who knew how to treat sheep, and not only gave those sheep change of food, but gave them highly nourishing food. He (Mr. Woods) had heard that Mr. Harvey had been advised to slaughter the whole of his flock, when they were first seized, and when he had something like 1,800 or 1,900 lambs on his farm. He also heard the statement indirectly contradicted, but the statement was so astounding that he never dared make use of it for fear of saying what was not true. He wrote to Mr. Harvey the day before yesterday, and asked him plainly whether such was the fact or not; and Mr. Harvey said, in reply:

7th November, 1866.  
 It is also true that it was recommended to Capt. Lambert, by a Government veterinary authority, to kill the whole flock (or so he understood it), and that I scouted the idea, and wrote myself to the Privy Council, stating I hoped that it would consider well before adopting such a course, or sanctioning the dictum that the disease was cattle plague without further information, and also stating, if it was really cattle plague, at least half recovered, and that this indiscriminate slaughter was very wrong.

Mr. Harvey's conduct in that matter was beyond all praise. If Mr. Harvey had been seized with the panic attempted to be forced on him, that panic would have taken hold of the

country, and not a flock would have been safe from slaughter, by order of the veterinary inspectors. In Wiltshire, one flock was slaughtered chiefly because the sheep were suffering from a disease like that at Crown Point; but Mr. Harvey, with a nobleness of conduct that did him infinite credit, and for which he deserved the hearty thanks of every flockmaster in England, determined to see it out. On the Saturday following the meeting of the deputation at Crown Point two gentlemen went to Mr. Harvey and offered to buy the whole of his lambs—two men of sound judgment and great experience, who were not likely to make a mistake. This was a fact which showed that those men of experience had a reasonable ground for believing that if they gave those lambs a change of food and a change of locality they would save a large per-centage of them. Mr. Harvey told them that if they would give him ten thousand pounds for the remainder of the lambs he would not let them go, and by so doing run the risk of having it said, if risk there were, that he had helped to send the disease to other parts of the country. He now came to the most important part of the information connected with the cattle disease that he had yet heard. Count Nesselrode, a Russian nobleman, and an extensive landed proprietor, was staying at Merton-hall, and had authorised him to state to that meeting that in 1861 he lost the whole of his large herd of cattle from *rinderpest*. He had at that time 10,000 sheep running on the same land with the infected cattle, but not a single sheep was attacked with the disease. Count Nesselrode had entirely given up keeping cattle in consequence of the *rinderpest*, and kept sheep only, for it was found that they did not take the disease, although it had been tried to be made out that there had been cases of *rinderpest*: but it always proved to have arisen from improper feeding and management. If a man of the standing of Count Nesselrode in Russia, and of his great experience, instructed him to say upon his (Count Nesselrode's) authority, that sheep in Russia did not take the disease, he would ask how could they take it in England? He now came to the close of his address. It had been said that he had taken a negative position with respect to the sub-committee of the Cattle Plague Association relative to these sheep trials. This he begged publicly to deny, and he would show why he had not gone in opposition to them. In the first place he was personally acquainted with every gentleman on the sub-committee, and they were all gentlemen for whom he had the most profound regard. He honestly believed that their only object was to do the best they could with the funds at their disposal, and for the interests of the insurers; consequently, why should he wish to oppose them? But, while they claimed for themselves the right of free expression of opinion, they should accord the same privilege to others. If he had taken a strong stand he had done so with a good intent and on public grounds, and he would ask the meeting whether he had not laid before them just and reasonable grounds for the position he had taken? And what should he gain supposing he proved his position to be right? Only the consciousness of having done his duty. If, on the other hand, he was proved to be wrong, what should he lose? But in the latter case, he should do as every honest man would do, and admit that he was mistaken. While saying this he must also say that he felt no hostility to the members of the sub-committee, though he would maintain his unyielding and uncompromising opposition to anything like scientific delusions. Science had done much for agriculture, and might do much more; but it had many mistakes, and one among the number that would take the first rank was the endeavour to persuade the public that the *rinderpest* existed among the sheep at Crown Point.

**DEATH OF MR. HUGH WATSON.**—This celebrated Scottish agriculturist died at his residence, The Den, near Perth, on the 10th Nov., in his 78th year. For nearly three years he had been confined to his room with a chest complaint, originating in neglected bronchitis; and it was quite a miracle that he should have lived so long. The following sketch of his history is from Mr. Dixon's recently published work, "Field and Farm; or, Scottish Flocks and Herds." "The castle of old Fortar might once, as a poet observes, have been 'stuffed full of Englishmen,' but we had no time to inquire after the fate of our compatriots, as we pointed straight from

Kirriemuir to Mains of Kelly. Keillor, which has always been regarded as the very Waraby of the 'doddies,' lies about twelve miles from it, and a little east of Cupar Angus. It will be four years come Martinmas since Mr. Watson left it, after a residence of four-and-fifty years, and retired to a new home in Perth. He was purely catholic in his cattle tastes. Bracelet, Charity, and one or two more of the pure Booths were the models he kept in his eye, in building up his blacks; and even in a shire so strongly wedded to its own breed, he did not shrink from saying so. Many of his dearest friends lived over the Border—John Booth, Anthony Maynard, Wetherell, Torr, and Philip Skipworth—and he loved to go shorthorn and sheep judging with them to Ireland, and to call to mind Booth's merry jokes and his practicals on old Philip. He had also many 'a quiet day at Wiseton' with the first earl among the shorthorns; and he was walking with his lordship on the race-course at Doncaster, just before Eli's St. Leger, when he first met Sir Charles Knightley. The old baronet began to rally him directly after they had been introduced, in allusion to the earl's politics, on 'not keeping better company.' Before the end of the week they met again at a sheep sale at Wooler, and for many years kept up a strong correspondence. Old Jock (1), Strathmore (5), Angus (46), and Pat (29), were his four favourite bulls, and there is a strain of them in every great black herd. Old Jock was the most stylish of the lot, and showed, as his owner never scrupled to say, 'much of the shorthorn superiority in hair and touch.' His son Pat thought nothing on one occasion of walking eighteen miles to a show, and winning; and his son, Hanton, made the herd fortunes of McCombie, who bought him for 105 gs. when he had won at Berwick. Old Jock was sold for 100 gs., after taking a Highland Society first in 1844. In 1852 his son Grey Breasted Jock, or Second Jock, beat all the polled bulls in a sweepstakes at Perth, when he was thirteen; and Black Jock (3) and Young Jock (4) kept up the line. 'Keillor Watson,' as he is always called, began to show in 1810, and won upwards of two hundred prizes for sheep and 'doddies' in the next thirty-three years, principally at Strathmore (Cupar Angus), the Highland Society, and the Royal Irish. Some of these must be credited to thorough-breds and cart-horses, and among the medals and other trophies there are not a few race-cups. Old breeders still speak with rapture of the heifers which he showed at Perth in '29; and his Leicester rams were so good and level on that occasion, that each of the three judges had got a different one for first. 'Twenty-nine was also the year of his Smithfield heifer; and so delighted was Earl Spencer, the president of the club, with her, that he requested that she should be modelled and struck off on a medal. He also gave the Irish a taste of his quality, and made several large sales there. His four-year-old Angus ox went over, and was placed first for the Purcell Challenge Cup at Belfast, and yet, strange to say, died after all in the plough at the Royal Home Farm when he was rising eighteen. Still his fame was in all lands, as a traveller in India found his portrait pasted up on a temple of Vishnu. His longevity was hereditary from his dam, old Grannie, who gave no milk after she was 28, and ended in July, '59, a pilgrimage of 35½ years. From one to three she was often shown, and very seldom beaten as a cow; and her guardian, James Thompson, after forty-two years of service, received one hundred francs as a tribute from the 'Société Protectrice des Animaux.' She is 'the prima cow' of the polled herd-book, and dates from 1824; while Colonel, the premier bull, is six years her senior. This book, which was published in April, 1862, contains entries from 126 owners, 31 of them Galloway men. Of the 336 numbered bulls, 45 are Galloway, and the cows of the sort muster 95 out of 846. Mr. Watson kept Leicesters on his low land, and southdowns, to which he had always a strong leaning, on the hill. In 1838, he could record that he had bred the latter for five-and-twenty years, that he thought them as hardy as the Cheviot, and that their snug-woolled heads and necks dried sooner after a storm. In another respect he found them very superior, as he could always fatten them much better off grass the year their lamb was taken from them. His experience of their hardihood was drawn from the fine middle range of the Seidlav Hills, where they browsed upon the green sward, intermixed with whin and heather, five hundred to twelve hundred feet above the level of the sea, a spot 'too high for Leicesters, and under the level at which the native black-face only thrives.'"

## THE BATH AND WEST OF ENGLAND AGRICULTURAL SOCIETY.

The usual monthly meeting of the Council was held at the Railway Hotel, Taunton, on Saturday, the 11th of Nov, under the presidency of the Earl of Portsmouth. There were also present Colonels Acland, M.P., Archer, and Luttrell, Drs. Brent, Gillett, and Scott, Rev. T. Phillpotts, Messrs. G. H. Andrews, R. Bremridge, R. H. Bush, J. H. Cotterell, E. S. Drewe, T. Danger, J. Daw, B. R. M. Daw, T. Daskham, H. Fookes, M. Farrant, J. Fry, Jonathan Gray, J. Gould, J. D. Hancock, J. Hole, T. Hussey, H. P. Jones, B. K. M. King, R. May, G. S. Poole, W. Porter, J. W. Sillifant, J. C. M. Stevens, H. Williams, W. Wippell, and J. Goodwin (Secretary and Editor).

Dr. GILBERT brought up the quarterly report of the Finance Committee, and various sums of money were ordered to be paid in accordance with its recommendations.

THE SALISBURY MEETING was fixed to commence on Monday, June 4th, 1886, and it was directed that all entries of Stock, Poultry, Implements, and Works of Art be made by the 14th of April.

THE STOCK PRIZE SHEET was accepted and confirmed; the Society's prizes amounting to £1,092; those offered by the Salisbury Local Committee to £150; total prizes for Stock £1,242. In the prize sheet Devon, Herefordshire, and shorthorn cattle are all placed on the same footing. In the sheep classes several additions have been made; prizes are now offered for Leicesters, Cotswolds, other Long Wools, South Downs, Hampshire Downs, Shropshires, Oxford Downs, Somerset and Dorset Horns, and Mountain Sheep. In the horse classes there are prizes of £50 for the best thoroughbred stallion; £30 to £15 for the best stallion for agricultural purposes; and prizes varying from £25 to £10 and £5 for mares, colts, &c.; total prizes for horses £375. The prizes for pigs remain the same as last year; the amount being £64. Mr. Miles, of Dixfield, Exeter, again renews the offer of prizes for shoeing smiths.

The following is a list of the Salisbury Local Prizes:—*Channel Islands Cattle*—A first and second prize of £5 and £3 respectively for bulls of any age, two year-old bulls, yearling bulls, dairy cows, three-year old heifers; *Cattle of any breed*—A first and second prize of £5 and £3 respectively for dairy cows; ditto for heifers. *Sheep* prizes of £5 and £3 for pens of Hampshire Down ram lambs, and ditto for pens of ewes in their wool, part to be shorn in the yard. A prize of £5 for the best pair of working cart horses. Prizes of £5 and £3 for the best New Forest pony; similar prizes for the best mare and foal; and £5 for the best pair of ponies.

Prizes of £5 and £3 for Berkshire boar pigs; ditto for breeding sows; ditto for the three best breeding sows above four and not exceeding eight months old. Prizes of £10, £5, and £3, for Wiltshire cheese; £5 for the best sack of wheat grown within 90 miles of Salisbury; and £5 for the best sack of barley; total, £150.

POULTRY PRIZES.—Dr. Brent, one of the stewards of poultry, brought up the prize sheet for his department. The total amount of prizes offered is £150.

ARTS DEPARTMENT.—On the motion of Mr. H. Williams, seconded by Mr. Drewe, the sum of £400 was voted for the erection of a new arts building at the Salisbury meeting.

DAY FOR HOLDING COUNCIL MEETINGS.—After much discussion it was resolved that after the present year the meetings of the Council be held on the last Tuesday instead of the second Saturday in the month: this arrangement set to take effect till the February meeting.

PAYMENT OF JUDGES.—It was resolved on the motion of Mr. H. Fookes "That in future the Society's judges of Stock at the meetings of the Bath and West of England Society be paid £5 each for their trouble, such sum to include all expenses excepting first-class railway fare to and from the place of meeting."

INTERNATIONAL CHEESE EXHIBITION AT PARIS.—The following letter was read by the secretary:—

Office of Committee of Privy Council for Trade,  
Whitehall, 4th November, 1885.

Sir,—I am directed by the Lords of the Committee of Privy Council for Trade, to transmit to you for the information of the Bath and West of England Agricultural Society, the accompanying copy of a programme, &c., of a proposed International Cheese Exhibition intended to be held at Paris in December next, and which has been received from His Majesty's Charge d'Affaires at this Court.

I am, Sir,  
Your obedient servant,  
J. HANCOCK TARRANT.

(Signed)  
The Secretary to the Bath and  
West of England Agricultural Society.

The exhibition above referred to will take place on the 21st of December.

NEW MEMBERS ELECTED.—Messrs. Ingram and Phillips, Staunton Ironworks, Fordingbridge, Hants; Mr. Richard Woodward, Chargrove, Cheltenham; Messrs. Wilkinsons, Brothers, Market-place, Bath; Mr. Fredk. Shum, Laura-place, Bath; Mr. J. H. Clark, Altwood House, Maidenhead.

## CALENDAR OF AGRICULTURE.

Plough stubbles and leys for Lent crops and fallows. In fresh weather repair old fences, and make new ones. Continue the cutting of drains so long as the weather allows. Mend roads and cart-up earths for making composts. Collect for manure, in every shape or form, all earthy and vegetable substances that can be got.

Flood meadows, and lay dry occasionally.

Cut underwoods, and fill up vacancies by planting and layering. Plant all kinds of forest trees, especially ash and oak. Keep fences in good repair, to prevent trespassing—a very sure mark of slovenly management. Raise turnips from the ground in dry fresh weather; give the tops and small roots to young cattle in the yards, and to the store sheep in the fields.

Early lambs will be dropped this month in some

places. Feed the ewes amply, and provide good shelter.

During frosty weather thrash grains very frequently, and litter the yards very often. Collect earths to the compost heaps, and carry lime for mixing with the earths. Carry stones for draining; timber, faggots, and coals for fuel.

The proper arrangements are now made of a systematic management in every department of the winter operations. The live stock require the most vigilant and unremitting attention, in being regularly and amply fed, and in having a dry and comfortable lair in the yard and sheds. Stunt roots and meals for cows, pigs, and poultry; give the food in a fresh condition, without any sourness or acidity. Give to the cattle the turnips from the store-pits during stormy weather, but from the

fields daily when the weather permits. The drains and culverts must be all in good current order, to convey the urinary liquids to the tank. The cattle in the yards eat under cover in high cold latitudes, from cribs placed in the shelter-sheds.

The grains and animals, with all moveable articles, being the property of the farmer, are insured at his cost; the buildings by the proprietor, being

his charge. Every kind of rural produce is now insured most safely and economically at the Royal Farmers' Insurance Office, and proprietors and farmers who neglect the yearly precaution by not insuring are most culpably faulty, and commit an injury not only to themselves, but against the public at large.

## CALENDAR OF GARDENING.

### KITCHEN GARDEN.

Frost may set in early, and then all plants under glasses, in frames, and in warm borders require the protection of matting, fern and littery straw being laid over them. In this way late-sown radishes are preserved under straw, which is raked off in dry sunny weather. Little can be added to the general directions of last month. All is contingent; if the weather be open, there is every probability that it will be wet; and then to trample upon and work ground saturated with water is only to do much harm.

Sea-kale: Pot and excite a second set of plants. Brick pits and darkened frames, with good linings, would be a great convenience, and prevent much litter.

Asparagus is easily forced upon deep beds of leaves raked from woods and parks, avoiding those of laurels and evergreens generally. The plants should be prepared in proper beds for the express purpose, and selected from the best two or three-year-old stock. Brick pits are the best erections; but good frames, set upon leaves, with warm linings, will do well.

### FLOWER GARDEN.

Cover the ground with half-decayed leaves, or lay cakes of moss among the shrubs, keeping them in order by small stones; and in the event of snow, lose no time to brush it off evergreens, if the sun shine hot upon them, as alternate thawings and freezings ruin foliage.

## AGRICULTURAL REPORTS.

### GENERAL AGRICULTURAL REPORT FOR NOVEMBER.

Notwithstanding that large quantities of rain have fallen in most parts of the United Kingdom, the progress of ploughing and sowing has been somewhat rapid. The young wheats are now well above ground, and indicate great healthiness. Increased quantities of wheat have been thrashed out in the leading counties; and most of the markets have been fairly supplied with samples. Really fine qualities have moved off slowly, at about previous quotations; but inferior parcels have given way 1s. to 2s. per quarter; apparently, wheat has seen its highest range of value for the present. The millers are well in stock, and there is no disposition shown to speculate in any kind of produce on the part of the leading houses. The large quantities of grain on passage from the Black Sea ports, and the fall of 2s. to 3s. per quarter in the rates demanded for forward shipment, have tended to depress the trade generally. We are not likely to receive any quantity of either wheat or flour from America during the winter months; but we shall, no doubt, import largely from France, Holland, &c., at prices which will effectually prevent an upward movement in the quotations here. Very little fine English barley has been brought forward, and the inquiry for it has ruled steady, at extreme rates. Inferior parcels have given way 1s. to 2s. per quarter, with a dull sale. Malt has somewhat declined in value; but oats, beans, and peas, have changed hands freely at full prices. The transactions in flour have been to a moderate extent, at late currencies.

The new crop of English wheat is turning out well as to quantity; but the bulk of it is in very middling condition. The imports from the continent have shown a want of quality, consequently have been held less firmly. Barley is certainly about an average crop; but the yield of oats, beans, and peas, though rather larger than in 1864, is deficient.

The reductions in the Bank rate for money to 6 per cent, and the great activity for woollen goods in the manufacturing districts, for shipment to America, have given additional firm-

ness to the wool trade. The sales of colonial wool, at which about 60,000 bales will be brought forward, are going off briskly, at an advance in the quotations of 0½d. to 1d. per lb. English wool has, consequently, commanded rather more money. The supply in the hands of our manufacturers are very moderate, even for the time of year. On the continent, the inquiry for wool has certainly improved.

Most of our markets have been heavily supplied with potatoes in good saleable condition. A few fine samples have realized 110s. per ton; but other qualities have ranged from 50s. to 90s. The losses from disease have been very moderate, and we may safely conclude that large supplies will continue on offer for some time. The moderate range in the value of potatoes must have some influence upon the wheat trade. The imports from the continent have been limited for some time past.

There has been about an average business doing in nearly all kinds of hops, and the quotations have been well supported. The quantities on offer have been moderately extensive, and the imports from abroad have been on a liberal scale. The best new English have sold at 180s. to 190s. per cwt.

The root crops have turned out remarkably well, and of good quality. There is, consequently, a full average supply of cattle food on hand. The outlay for linseed and cakes for some time will be trifling when compared with some former years. There is, however, no disposition on the part of holders to accept lower prices for those articles.

The quantities of hay and straw on offer have been only moderate. The demand has not improved; nevertheless the quotations have been well supported. Meadow hay has sold at from £4 to £5 15s., clover £5 to £7, and straw £1 18s. to £2 5s. per load. The quantity of hay in stack in various parts of the country is large.

The price of nearly all kinds of meat has been very high during the month. Our impression is that the supply of English stock, both beasts and sheep, is gradually decreasing, and that really prime animals will command high currencies for a

considerable period, the large increase in the importations notwithstanding. The great falling off in the arrival of cured provisions from America and other quarters compared with last year—over 1,000,000 cwt.—has, of course, given great firmness to the bacon market, and reduced our supplies of food considerably. At New York, bacon, hams, lard, &c., are much higher in price than in England, and whilst high rates prevail we can hardly anticipate an increase in the shipments.

The Scotch markets have been but moderately supplied with wheat. The trade, however, has been very inactive, on rather lower terms. All kinds of spring corn have moved off freely, at extreme quotations. The shipments of potatoes to the south have been on the increase.

In Ireland no new feature has presented itself in the grain trade. Fine wheat, barley, and oats have sold freely at full quotations, otherwise the transactions have been very moderate. Increased quantities of produce have found buyers on English account.

### REVIEW OF THE CATTLE TRADE DURING THE PAST MONTH.

In the early part of the month, the supplies of English stock on sale in the leading markets of consumption were very moderate, and in but middling condition. Prime beasts were, therefore, in good request at enhanced quotations. Since then, however, increased numbers have been brought forward, and the upward movement in value has not been supported. The quality of the foreign beasts exhibited has shown signs of improvement, and we are now receiving fewer store animals than usual; the consequence is that some addition has been made to the supply of meat, and that a check has been given to the high rates current during the greater portion of the year. We do not see, however, how any material reduction can take place in prices, as the arrivals of stock from the continent will be on a moderate scale during the whole of the winter months. The number of diseased animals seized in the Metropolitan Market has been very small, although heavy losses have been sustained in the agricultural districts. Very superior Scots and crosses realized 5s. 6d.; but the closing figure, as a general quotation, was 5s. 2d. per 8 lbs.

Rather large numbers of sheep have been brought forward, but, as respects London, about one-third of them have been derived from abroad. Prime downs and half-breds have sold freely, other kinds slowly: the former have readily produced 6s. 8d., in some instances 7s. per 8 lbs.

Increased numbers of calves having been on sale, the veal trade has continued in a most inactive state, at drooping currencies. The reduced rates have ranged from 4s. to 5s. per 8 lbs.

Small pigs have been scarce and dear; whilst inferior pork has sold slowly. The commencement of the season has induced the holders of pork to demand unusually high quotations.

Although the supply of food for cattle is very abundant in most parts of England, strong prices have been realised for hay, and the probability is that that article will continue dear for several months.

The imports of foreign stock into London have been as follows:—

	HEAD.
Beasts ... ..	16,254
Sheep ... ..	52,517
Lambs ... ..	1,269
Calves ... ..	2,526
Pigs ... ..	7,770

Total ... .. 80,336

#### COMPARISON OF IMPORTS.

November.	Beasts.	Sheep.	Calves.	Pigs.
1864 .....	17,137	34,792	2,970	3,947
1863 .....	11,020	30,347	1,770	2,202
1862 .....	6,839	28,577	1,659	633
1861 .....	5,295	27,833	946	1,241
1860 .....	6,961	22,723	1,604	828
1859 .....	5,927	21,907	997	159
1858 .....	4,787	18,258	1,174	156
1857 .....	4,409	17,830	2,687	136
1856 .....	6,102	16,380	1,152	309
1855 .....	7,367	17,094	1,127	454
1854 .....	7,120	16,604	1,108	369

The total supplies of stock on offer in the great Metropolitan Market have been:—

	HEAD.
Beasts ... ..	36,520
Cows ... ..	295
Sheep ... ..	167,230
Calves ... ..	2,533
Pigs ... ..	2,811

#### COMPARISON OF SUPPLIES.

November.	Beasts.	Cows.	Sheep.	Calves.	Pigs.
1864 .....	32,600	542	114,300	2,587	2,900
1863 .....	27,704	506	99,130	2,156	3,170
1862 .....	30,139	532	110,020	2,313	3,172
1861 .....	26,590	560	109,370	1,370	3,439
1860 .....	25,400	500	103,600	2,113	2,219
1859 .....	26,492	523	120,840	1,299	2,400
1858 .....	24,856	534	114,643	1,437	2,973
1857 .....	25,383	504	103,120	3,002	3,067
1856 .....	25,444	515	106,750	2,096	3,411
1855 .....	27,411	457	97,460	1,585	3,555
1854 .....	23,442	512	121,031	1,848	2,734

The district arrivals of beasts thus compare with the three previous years:—

	Nov., 1862.	1863.	1864. 1865.
From Lincolnshire, Leicester-shire, & Northamptonshire	14,370	9,300	9,300 9,900
Other parts of England.....	3,450	2,800	2,700 3,000
Scotland .....	74	309	554 440
Ireland .....	3,300	2,800	2,000 1,700

Beef has sold at from 3s. to 5s. 6d.; mutton, 4s. to 6s. 8d.; veal, 4s. 4d. to 5s. 4d.; and pork, 4s. to 5s. 8d. per 8 lbs., to sink the offal.

#### COMPARISON OF PRICES.

	Nov., 1861.	Nov., 1862.
	s. d. s. d.	s. d. s. d.
Beef from .....	3 0 to 5 2	3 4 to 5 0
Mutton.....	3 2 to 5 8	3 8 to 5 0
Veal .....	4 2 to 5 4	3 4 to 5 0
Pork .....	3 10 to 5 0	4 0 to 5 0
	Nov., 1863.	Nov., 1864.
	s. d. s. d.	s. d. s. d.
Beef from .....	3 4 to 5 0	3 4 to 5 8
Mutton.....	3 8 to 5 8	3 10 to 6 0
Veal .....	3 4 to 4 8	4 0 to 5 2
Pork .....	3 4 to 4 6	3 8 to 4 8

There has been a considerable increase in the supplies of meat on sale in Newgate and Leadenhall markets. Sales have consequently progressed slowly at drooping prices. Beef closed at from 2s. 10d. to 4s. 8d.; mutton 3s. 6d. to 5s. 4d.; veal 4s. to 4s. 8d.; and pork 4s. to 5s. 4d. per 8 lbs., by the carcass. These quotations show rather an important decline since the commencement of the month.

### NOTTINGHAMSHIRE.

We have an abundance of grass on our pasture lands, and the aftermaths have been remarkably heavy. Some say too long pastures have been against the health of stock, when they lay down, had too much wet grass about them. There may be some truth in it, and we think it wiser to graze all down as evenly as we can. To let any field run to seed must involve loss. Both sheep and cattle have increased in weight considerably the last two months; and it should bear down the price of meat, a very desirable matter with our enormous population. The rinderpest, we hope, is in some measure stayed. It is truly an alarming affair for the farmer to look upon his stock, all in high health and so pleasing to see, and at the same time to be reminded that to-morrow death may be among them and blast his hopes is truly humiliating, and he has the truth forced upon him that the cattle on a "thorough hill is the Lord's." The measures adopted in regard to fairs and markets and the transit of stock must meet with general acquiescence. Let the cattle of the country have the strictest cordon which can be thrown around them; and if it is, as represented, so contagious, that is all we can do. We hear of one complaining except the dealers (jobbers), and their general treatment to cattle is often so shameful that it would be a blessing for them to lay aside their craft for a while; the country would spare them well, and they may have been the means of promoting some of our ills. We see cattle and sheep ad-

tised for sale by private contract on the farms of the owners, so that our necessities for the time will soon devise a means for supplying the public wants. Seed time is nearly over, with about the usual breadth of wheat put in. It has not, on some lands, been the most favourable season; but so much depends on the future with wheat, that it is absurd to draw any conclusion. The thrashing of wheat has been almost continuous, and the supply ample enough. We hear few complaints about the yield, and in several instances more have been delivered than sold—a clear proof that it had exceeded the calculation of the seller. The mangel-wurzel crop is heavy, the best we have had for years. The season has been favourable, and more attention is paid to its management. The turnip crop is a partial one, and the Swedish variety small in size. We had too much mildew about them to give a crop, and we doubt their keeping capabilities. One thing we learned last winter, a lesson of some worth—how to economise our roots. They are either food or physic; and by using them more sparingly we have the food, and unsparingly the reverse. Our corn markets have been fairly supplied, and with an upward tendency; we think the lowest point is passed, and the future more hopeful for the producer. Our great season for the hiring of servants is at hand, and, so far, there is little alteration in the rate of wages. There would be depression enough were it not that our mining and manufacturing interests absorb such an enormous amount of labour: and it seems strange, with fifty per cent. higher wages about the coal pits, &c., that so many should remain about the homestead of the farmer. Is it the love of rural life? All attempts to do away with our hiring places are, so far, void, and the farmers say they must have rough minds for rough work; so mind does not go for much at the dung-cart—"every man in his order." And so every generation seems to produce a class of individuals who will be at the foot, and laugh at any ameliorating effort. We only repeat what we have so often expressed at this period of the year, that in our opinion our statutes for the hiring of servants are a standing disgrace to the country, and that he who goes to engage labourers at such places promotes one of our great social evils.—Nov. 22.

## AGRICULTURAL INTELLIGENCE, FAIRS, &c.

**ANDOVER HOP FAIR.**—Many parcels of hops which had been held over by growers and housed from last Weyhill fair were on offer, although the chief supply was in the hands of merchants, which indicates that hop-growers have very generally sold this year's growth. The demand for best samples of hops ruled active, Sussex hops made from 24s. to 25 10s. per cwt., Hampshire growths 24s. 10s. to 26s. and some parcels of Farnhams realised 21s. to 21½s. and Kent samples 26s. to 29s.

**BOSTON FAT STOCK MARKET.**—A moderate supply of fat sheep, with a slow trade, at 8d. per lb.

**BOSTON HORSE MART.**—There was only a meagre show of animals, and buyers did not appear to be very numerous. The best sort of cart colts made good prices, but other kinds were difficult to quit, and many were taken home again unsold. The best two-year-old cart colt that was exhibited was purchased by Mr. Kirkham for £40, the highest price realised throughout the fair. A yearling out of the same mare as the above was sold for £25 10s.

**BRECON FAIR.**—A large number of sheep were sold at good prices. Among the number were many hill wethers fit for the shambles, which butchers from the iron districts bought readily at prices averaging about 8d. per lb. A good deal of business was also done in the horse fair, especially with the mountain ponies, of which there were many changed hands. Cattle, by order, excluded. There were a great number of pigs, but prices were rather on the decline.

**DAVENTRY FAIR** for the sale of sheep only. There was not a large supply, and trade was rather dull for all sorts. The best mutton fetched about 6s. per stone, and good lambs for keeping about 40s. each.

**DOUNE SECOND TRYST.**—The number of sheep on sale never was so small, but though this was the case the supply was equal to the demand. Those brought forward consisted of blackfaced and Cheviot ewes, with a few wethers. The prices for all kinds were as good as at the last tryst; indeed they were, if anything, a shade firmer. Mr. James

Graham, Myothill, Denny, purchased a lot of blackfaced ewes and wethers, mixed, at 24s. 6d., which he resold at 29s. Mr. Peter McCaul, Dumblane, sold a lot of blackfaced ewes at 28s. Mr. Forbes McCaul sold a lot of Cheviot ewes to Mr. Graham at 30s. One and two years old colts were selling at from £10 to £25, and good draught horses at from £25 to £36. Mr. Christie, Stirling, sold at from £15 to £35. Mr. Peter Scott, Yetta-o'-Muckhart, sold draught horses at from £30 downwards.

**DUMFRIES PORK MARKET.**—The present high prices of mutton and beef have led farmers to look forward to high prices. About 200 carcasses were brought forward; but they were in far from good condition for curing. Buyers, on this account, were shy at coming to terms; and the high prices sought also frightened them. On this account the market was dull, and sales moved very slowly till the close. For the best lots from 7s. 4d. to 7s. 6d. per imperial stone was given; for secondary sorts, from 7s. to 7s. 3d.: and for heavy ones, from 6s. 6d. to 7s.

**GARSTANG MARTINMAS FAIR.**—The market for cattle, according to orders issued by Council, was completely closed. There were not many sheep on sale. However, what were exposed sold at good prices. We have not seen a better show of horses for some years, and a tolerable trade was done in good cart-stags and anything useful, at remunerative prices. We are glad to say that we keep free from the cattle-plague here at present, and for some miles round us.

**MARLBOROUGH FAIR.**—The number of sheep was under the average; the trade was dull, and prices dear. Mr. Gale, of Burtage, obtained the top price (61s.) for lambs, and also for ewes. As a whole, the prices at Andover and Illey fairs were maintained.

**SALISBURY FORTNIGHTLY MARKET.**—There was a large number of beasts, and among them a fair proportion of good serviceable qualities. The high prices to which beef has been unwarrantably forced up by the unfounded reports of scarcity are now operating against trade, and to-day the greatest difficulty was experienced in obtaining the figures asked. Business, therefore, ruled excessively dull, with a downward tendency; and although many animals remained in the market until five in the afternoon, a clearance was not effected. In the sheep department there was an excellent supply. Previous quotations were asked for the best qualities; but the trade was decidedly inactive, and many pens were left unsold. Some of the local butchers have lowered the price of meat 1d. per lb.; but it is considered that the consumer is entitled to a reduction of quite 2d. per lb. on prime joints. Quotations: Best oxen realized from 12s. to 13s. per score, and heifers from 11s. to 12s.; mutton may be quoted from 7d. to 9½d. for the best Downs, per lb.

**SKIPTON FORTNIGHTLY FAIR.**—No horned cattle. The prices of fat stock sold out of the town were about 7d. per lb. In mutton, best wethers sold at 7d. to 7½d. per lb., and ewes at 6d. to 6½d. Butchers bought very slowly and sparingly. A good show of pork sold at 7d. to 7½d. per lb. Store pigs realized good prices.

**ST. COLUMB FAIR** was well supplied with fat and store sheep; but the sale, on the whole, was not brisk. Fat sheep fetched 7½d. per lb. There were no bullocks in the fair.

**TRURO FAIR.**—There were no bullocks, cows, or calves; and only 600 sheep—not one-half the average number usually offered—and for these few sales were dull, at lower prices, 7½d. being the top price for fat sheep. Several flocks were driven home unsold. Farmers generally evinced no disposition to buy, fearing to take the plague to their herds.

**YEOVIL FAIR** was well attended, the supply of stock being moderate. Barreners realized from £16 to £17 a pair. Sheep sold readily, at the following rates: Wethers 44s. to 48s., ewes 44s. to 47s. each. Pigs small supply.

**YORK HORSE FAIR.**—Two features were strikingly apparent in this annual chartered fair, and these the smallness of number and meagreness of quality of the animals shown. Anything really useful for agricultural or nag purposes was speedily bought at high prices, whilst animals of an inferior order were a drug upon the hands of those who offered them, and numbers of these were consequently left unsold.

**IRISH FAIRS.**—CARLAWTON BRIDGE: Some splendid looking lots of bullocks—as prime as ever were fed on the fertile fields of Meath—were quickly bought up for England in the early part of the day at £20 to £26 each, which might

be calculated at fully £3 3s. per cwt. sinking off. Beef, however, was down in price, generally speaking, and the average rate for good quality may be set down at 8d. per lb. on the foot. Store cattle appeared to have improved somewhat in price where they promised to turn out well after stall-feeding, but those out of condition were no more than a drug. The following may be taken as the ruling prices: Three-year-old heifers from £11 10s. to £15 each, two-year-olds £9 to £11, yearlings £4 10s. to £6 10s. each—in a few instances to £7 10s. per head. Bullocks, rising three years, fetched from £13 10s. to £16 each, two-year-olds from £10 to £13, yearlings from £7 to £9. A lot of two-year-old bullocks—certainly the pick of the fair—were sold by Mr. James McCormick to an English dealer at £14 each. Mr. M'Nally sold another prime lot, of like age, at £13 5s. per head. Milch cows were brought up with much avidity, more particularly by English and Dublin buyers. Of springers and strippers there was a fair show, and all were quickly bought up—the former from £14 to £24, and the latter from £9 to £13 per head. The exhibition of sheep was very fair; wether mutton brought from 8d. to 8½d., and ewe from 7d. to 7½d. per lb. Store hoggets and store lambs sold well. In pigs there was an animated trade, bacon going from 48s. to 56s., and pork at fully 7d. per lb. for prime, in sink; good strong stores £2 to £3 10s. each, while bonnies fetched from 20s. to 28s.; a general clearance was effected in pigs of every description. The horse fair was principally made up of nags of an inferior kind; the highest price given was £45 for a cob.—**RATONATH**: No beef or sheep. Springers scarce and dear, but pigs sold well. Bacon pigs brought 56s. per cwt., stores £2 10s. to £3 10s., slips or suckers 20s. to 35. Store bullocks were unsaleable, and the few sold were to graziers, at prices which would have been obtained for them last May, and in some instances less. Heifers were in better demand, but at prices that left the feeders nothing for the summer's grass. Not one-fourth of the cattle were disposed of.—**BADLYMAHON**: The supply of beef was tolerably large, and from 56s. to 55s.

was obtained, the latter for prime quality. Springers and milch cows in fair demand, and realized good prices; dry cattle of good quality were also in brisk demand, three-year-old heifers £12 to £15 two-year-olds, of which there was an abundance, £8 10s. to 10 gs. each; yearlings £5 10s. to £7 a head. The show of sheep was below the average. Some few lots of ewes sold at 48s., store hoggets 50s. to 55s. each. Best wether mutton 7½d. to 8½d. per lb., and the ewe about 1d. below that quotation. Lamb a small supply, with a brisk demand, at high prices; in some instances 48s. a head was obtained for them. Good bacon pigs sold at from £4 10s. to £6 10s. each; store ditto vary from £3 to £4 each. Suckers and weanlings scarce and dear.—**TULLOW**: The demand was rather dull for stores, especially for bullocks. Cows for stall feeding were much looked after, at say £11 to £15; yearlings brought from £7 to £9, and younger animals were proportionately high. Springers and milch cows met a fair demand at high prices. First-class beef sold at £3 per cwt., second ditto 50s. to 56s. The supply of sheep was exceedingly small, and prices of mutton may be quoted at 8d. to 8½d., inferior quality 7d. to 7½d. per lb. Lambs averaged from 35s. to 45s. The pig fair, which was held on the previous day, was very well supplied with a good description of animals. Pork went at 56s. per cwt. being rather an advance on late quotations; stores 56s. to 60s., and young pigs were £1 10s. each.—**GOREBRIDGE**: Store stock was more plentiful, and sold at a shade lower than the prices of the recent fairs. Sheep were also in very short supply. Hoggets were more plentiful, and sold well. The attendance of buyers was large, but the business done was confined to store stock. Fat cows averaged from £10 to £13, new milch cows £12 to £14, two years old bullocks £7 10s. to £9 10s., yearlings £5 to £7, weanlings £3 to £4 10s. Fat sheep brought from £3 10s. to £3 5s., hoggets £1 15s. to £2. The pig fair took place the day before, and was well supplied. Bacon rated at from 53s. to 55s. per cwt.; stores went at from £2 to £3 10s. each, bonhams 35s. to 42s. per couple.

## REVIEW OF THE CORN TRADE DURING THE PAST MONTH.

The final week of the month of October, which we could not include in our last report, closed briskly with an advance of 2s. on wheat, and 3s. per sack on town-made flour. Indeed, it was a period of movement throughout, barley being 1s. to 2s. higher, as well as beans, while oats improved 6d. to 1s. per qr. November has presented the following features. For the first fortnight it was of a seasonable character. There was plenty of fog, more especially at the commencement; but with most of the time open and partly brilliant, farmers lost no opportunity of doing a large amount of business in the way of seeding their lands. Afterwards it became more unsettled, and, finally, a week of storms and deluging rain brought frightful disasters by land and sea, and left many of the heavy lands in anything but a condition for finishing the work. Let us hope, however, with good drainage and drying winds, everything will be completed before Christmas. The return of damp has made sad havoc with the newly-thrashed samples, and brought dulness into the trade after a good run of business, and the samples are now so bad that we can hardly hope for much amendment before the nipping frosts of next January set in. The market received its first check on the second Monday, and, so far as we can fairly speak of qualities unfit for

the mill, the movement has been downward. Nevertheless, everything good and dry has found buyers, even in the London markets, where the wealth of millers enabling them to import and hold foreign stocks, they are comparatively independent. The ascensional movement of the averages, however, show the real state of the country, and we are as far as ever from believing in a return to low prices as a rule, whatever fluctuation may prevail. As respects foreign countries, France has lately been an exception to the general movement throughout Europe, having lowered prices, say from the highest 1s. to 2s. per qr.; and yet France herself was among the first to report an inferior crop. This state of things may arise from the fact that free trade in that country is yet a novelty, and that the last importation burnt the fingers of importers, so that they are wanting in spirit, and rather disposed to take things as they come, or to follow the English plan of taking a present profit, and leave the future to itself. The markets in the Baltic, though so soon after harvest, are really getting excited with the belief of their future incapacity to make shipments or possibly provide for themselves. This is the case in Dantric, Poland, and Denmark, while the Marks district in the vicinity of Hamburg is said not to have the tenth of a crop, and speculators are wild for rye at proverbially quiet Berlin.



Not much, we hear, is to come from the interior of Southern Russia; still less from the United States, compared with their former facilities of shipment; for statistics tell us that while in 1863 their estimate was 179 thousand bushels of wheat, 1864 was only about 160 thousand, and 1865 but 148 thousand; so that from the year of export, 1863, the diminution in round numbers is about four millions of quarters, or two-thirds of our average English receipts. Put the increasing cattle plague to this poor account, and what have we prospectively to look on but the odds and ends of shipments, or such as we can get? The following prices were recently quoted at the places named: At Paris the best white wheat was quoted 44s.; at Antwerp, red Baltic 48s.; Zealand, at Maestricht, 45s.; Wahren, at Hambro', 51s. (not worth over 50s. here); Holstein for spring 50s.; new wheat at Dantzic 50s. f. o. b. Floating cargoes of Ghirko 44s.; Banat wheat at Venice 41s.; Upper Canada wheat at Montreal 40s. per 480lbs.; Milwaukee and Chicago 39s., there having been a demand for the United States. At New York, old Chicago wheat was worth 40s. per 480lbs., and amber State 53s. 6d. per 480lbs. free on board.

The first Monday in Mark-lane commenced after small supplies of Wheat, both English and foreign. The show of samples this morning on the Kentish stands was very scanty, but rather more plentiful on those of Essex. Part of the supply being in good condition, an advance of 1s. per qr. was readily obtained, and the inferior found a better sale. The foreign trade, though not extensive, was very firm, and in some instances 1s. per qr. more money was paid in retail. Though the arrivals off the coast were not numerous, floating cargoes were rather lower. This week the London advance was generally sustained in the country, but without excitement, though some places of importance noted an improvement of 2s. per qr., as Hull, Stockton, Bourn, Spilaby, and Thirsk. On the other hand, some towns only quoted the previous rates, as Barnsley, Newark, and Newbury. Edinburgh was 1s. per qr. higher, but Glasgow was only firm. The tone of trade was against buyers at Dublin, but no rise in prices was noted.

On the second Monday the English supply was somewhat better, and that from abroad was about doubled. Kent again sent up but few samples this morning to the London market, and Essex only about an average number. Yet the trade showed symptoms of reaction, and the best qualities went off with difficulty on barely the same terms, and some of the inferior was unsold. The foreign trade continued heavy, and some factors accepted 1s. less money for Russian qualities, but the majority of holders were firm. Floating cargoes were without change of value. The country markets this week were less buoyant, and several gave way to the extent of 1s. per qr. Among these were Hull, Boston, Spalding, Maidstone, Rochester, and Gloucester; but other places were firm, as Birmingham, St. Ives, Sleaford, Leighton Buzzard, &c. Liverpool was down 2d. per cental on the week. Both Edinburgh and Glasgow were 1s. per qr. lower, but Dublin was only dull.

The third Monday was supplied with rather less

English and foreign than in the previous week. A few more samples were seen this morning on the Kentish and Essex stands; but the condition was much affected by fully a fortnight's damp weather. The very few parcels of dry that were found about maintained the previous currency; but it would have been difficult to clear those that were damp at 1s. to 2s. less money, as they were below millers' use. Though the state of the English trade was calculated to increase the demand for dry foreign, yet scarcely any inquiry was manifest, and to have sold freely 1s. less must have been accepted. With better arrivals off the coast, there was no disposition to make purchases. The damp weather influencing every market in the country, there was universal dulness, yet without a decided decline on dry and fine qualities, these being scarce; and, on this score, there was so general an agreement that it seems needless to particularize. Glasgow declined 1s. per qr.; but Edinburgh was not decidedly cheaper. At Dublin, both the native and foreign trade were heavy, and rather in favour of buyers.

The fourth Monday was moderately supplied both with English and foreign samples. The quantity offering from Kent and Essex was small; but the condition was as miserable nearly as on the previous week, and the consequence was very little could be sold: really fine and dry lots, being scarce, were fully as dear, and old were more inquired for at the previous rates. There was rather more doing in foreign qualities; but the dull state of the market encouraged buyers to expect a decline, which, however, was not acceded to, the Baltic markets all coming high with reports as to the crops in Germany being worse than previously.

The imports into London for four weeks were 23,207 qrs. English, 48,195 qrs. foreign, against 18,846 qrs. English, 81,755 qrs. foreign for the same period in 1864. The London averages commenced at 45s. 1d. and closed at 49s. 4d. per qr. The general average began at 42s. 4d. and finished at 46s. 11d. per qr. The exports from London in four weeks were only 342 cwt. flour. The imports into the kingdom for the week ending 18th November were, in wheat 1,922,849 cwt., in flour 265,697 cwt.

The flour trade throughout the month has been very quiet, and scarcely any change of prices can be noted, though the last markets closed dull for country sorts; and rates were more nominal than real, from the absence of a demand, and increased supplies. But foreign arrivals have continued very short, both in sacks and barrels; and the lowness of stocks have kept such at full value. Fine extra qualities of American have even brought 30s. per barrel, and French to 36s. per sack; but Norfolks can hardly be valued over 33s., though the better marks have a higher range. Neither in Canada nor New York were prices suited to the English market; and, without an advance here, or a reduction there, there is very little prospect of supplies. The imports into London for four weeks have been 80,892 sacks country, 1,524 sacks 3,388 barrels foreign, against 54,803 sacks country, 749 sacks 10,856 barrels foreign for the same period in 1864.



## IMPERIAL AVERAGES

For the week ended November 18, 1885.

Wheat .....	71,570	qrs.	46s. 11d.
Barley .....	63,816	"	33s. 7d.
Oats .....	5,240	"	22s. 9d.

## COMPARATIVE AVERAGES.

Years.	WHEAT.		BARLEY.		OATS.	
	Qrs.	s. d.	Qrs.	s. d.	Qrs.	s. d.
1881 ...	83,608	59 10	79,738	37 6	10,520	23 7
1882 ...	65,475	49 4	75,247	36 4	12,672	21 5
1883 ...	87,492	39 10	83,523	34 0	8,017	18 9
1884 ...	71,614	38 9	77,409	30 1	5,023	19 11
1885 ...	71,570	46 11	63,816	33 7	5,240	22 9

## AVERAGES

FOR THE LAST SIX WEEKS:		Wheat.		Barley.		Oats.	
		s. d.		s. d.		s. d.	
Oct. 14, 1885 .....	41 11	30 4	20 11				
Oct. 21, 1885 .....	42 1	30 9	20 11				
Oct. 28, 1885 .....	42 4	30 11	21 0				
Nov. 4, 1885 .....	43 4	31 0	21 6				
Nov. 11, 1885 .....	45 3	31 6	22 0				
Nov. 18, 1885 .....	46 11	33 7	22 9				
Aggregate Average .....	43 8	31 4	21 6				
Averages last year .....	38 9	30 1	19 11				

## FLUCTUATIONS in the AVERAGE PRICE of WHEAT.

Price.	Oct. 14.	Oct. 21.	Oct. 28.	Nov. 4.	Nov. 11.	Nov. 18.
46s. 11d.	...	...	...	...	...	...
45s. 8d.	...	...	...	...	...	...
43s. 4d.	...	...	...	...	...	...
42s. 4d.	...	...	...	...	...	...
42s. 1d.	...	...	...	...	...	...
41s. 11d.	...	...	...	...	...	...

## PRICES OF SEEDS.

LONDON, MONDAY, NOV. 27.—The market for seeds has ruled firmer during the past week. Since Friday there has been renewed inquiry for French red Cloverseed, at full prices, buyers paying 1s. to 2s. more than they were willing to give last Monday. White Cloverseed meets more attention. Trefoils are firm in value, with improving inquiry. Canaryseed, with small arrivals, commanded full rates.

CUTLER AND BARKER, Seed-factors.

## BRITISH SEEDS.

MUSTARD, per bush., white .....	10s. to 12s.
CARAWAY, per qr. ....	50s. 56s.
TAREX, winter, new, per bushel .....	5s. 0d. 5s. 6d.
CLOVERSEED, red .....	—s. —s.
CORILANDER, per cwt. ....	—s. —s.
TRIFOLIUM .....	27s. 28s.
LINSEED, per qr., sowing 60s. to 62s., crushing .....	54s. 58s.
RAPESEED, per qr. ....	72s. 76s.
LINSEED CAKE, per ton .....	29 10s. to 210 10s.
RAPE CAKE, per ton .....	25 10s. to 26 0s.

## FOREIGN SEEDS.

CORILANDER, per cwt. ....	20s. to 22s.
CARAWAY .....	—s. 33s.
CLOVERSEED, red 42s. to 60s., white .....	—s. —s.
TRIFOLIUM .....	25s. 26s.
HEMPSEED, small —s. per qr., Dutch .....	—s. 48s.
LINSEED, per qr., Baltic 68s. to 60s. Bombay .....	68s. —s.
LINSEED CAKE, per ton .....	29 10s. to 211 0s.
RAPESEED, Dutch .....	—s. —s.
RAPE CAKE, per ton .....	25 0s. to 26 0s.

## HOP MARKET.

BOROUGH, MONDAY, NOV. 27.—Our market remains very quiet, and without change since our last report, no sales of any importance having taken place during the past week. There is still a fair demand for the better class of samples on hand at prices which fully support our former quotations; but we have very little doing in inferior grades of this year's growth, which are difficult to move except at reduced rates. There has been a better inquiry this week for yearlings and olds.

Mid and East Kents...	100s., 147s., 190s.
Farnhams & Country.	100s., 120s., 160s.
Weald of Kents	80s., 115s., 130s.
Sussex	70s., 100s., 112s.
Yearlings	95s., 120s., 135s.

## POTATO MARKETS.

## SOUTHWARK WATERSIDE.

LONDON, MONDAY, NOV. 27.—During the past week the arrivals coastwise have been limited, but rather heavy by rail; the trade slow, except for the best samples. The following are our quotations:—

Yorkshire Flukes ...	90s. to 105s.
Regents ...	70s. to 80s.
Dunbar Regents ...	70s. to 80s.
Perth, Forfar, and Fife Regents	60s. to 70s.
French and Belgian Whites	50s. to 55s.

## BOROUGH AND SPITALFIELDS.

LONDON, MONDAY, NOV. 27.—The supplies of Potatoes on sale are tolerably large. Most descriptions are in fair demand, at about the prices of Monday last. The total import, into London last week was 320 tons, chiefly from French ports.

Yorkshire Regents .....	65s. to 80s. per ton.
Flukes .....	80s. to 110s. "
Rocks .....	50s. to 65s. "
Scotch Regents .....	65s. to 80s. "
Kent and Essex Regents .....	70s. to 90s. "

COUNTRY POTATO MARKETS.—DONCASTER, (Saturday last): There was an average show of potatoes at market. Prices ruled from 6s. to 6s. 6d. per load of 18 stone.—YORK, (Saturday last): There was no diminution in the supplies, but the weather being very stormy the market was a dull one; nevertheless, the prices were rather higher. The quotations are 7s. per tub of 280 lbs., and 6d. to 7d. per peck retail.

## ENGLISH BUTTER MARKET.

LONDON, MONDAY, NOV. 27.—We note a dull trade, at declining prices; indeed, Butter is generally 4s. to 8s. per cwt. lower.

Dorset, fine .....	136s. to 138s. per cwt.
Devon .....	120s. to 128s. per cwt.
Fresh .....	13s. to 18s. per dozen lb.

ANDOVER CHEESE FAIR.—A brisk sale, dairy farmers obtaining an advanced value for their produce; but the increasing demand for milk by London milkmen has induced many cheese and butter dairymen in Hants to abandon the cheese press and butter churn, and send their milk to London.

BRECON CHEESE FAIR.—The supply of cheese was not quite so large as last year. Skim cheese about 5d. to 5½d. per lb.

CREWE CHEESE FAIR.—There were 50 tons of cheese. The prices were lower than last fair, ranging from 55s. to 70s. per cwt.

GLASGOW, (Wednesday last).—Arrivals of cheese moderate, and mostly secondary; but with those lying over, the market is kept full. About 15 tons passed the weigh-house, and, to make sales, 2s. to 3s. less had to be taken for late-made. Dunlop, new 58s. to 64s.; Cheddar-made, new 61s. to 66s.; skim-milk 26s. to 28s. per cwt.

## COVENT GARDEN MARKET.

LONDON, SATURDAY, NOV. 25.—The state of the market, both as regards supply and demand, is much the same as that given in our last report, with the exception of pine-apples, which are rather more abundant than they were last week. Pears still consist chiefly of Marie Louise, Duchesse d'Angoulême, Beurré Diel, and Van Mons Leon le Clerc. Grapes have slightly advanced in price. Kent alberts continue scarce. Oranges begin to make their appearance in considerable quantities. Potatoes of good quality are plentiful. French asparagus continues to make its appearance, and sells readily at high prices. Flowers chiefly consist of orchids, heaths, mignonette, chrysanthemums, Chinese primulas, and roses.

## FRUIT.

	s. d.	s. d.		s. d.	s. d.
Fine Apples, per lb. ....	4 0	6 0	Oranges, per 100 .....	4 0	10 0
Grapes, per lb. ....	4 0	8 0	Lemons, per 100 .....	8 0	14 0
Melons, each .....	3 0	5 0	Nuts, Cob, per 100lbs. 130	0	130 0
Apples, per sieve .....	2 0	3 0	Brasil, per bushel .....	12 0	0 0
Pears, per sieve .....	2 6	4 6	Almonds, per bushel 18	0	20 0

## VEGETABLES.

	s. d.	s. d.		s. d.	s. d.
Cabbages, per dozen .....	1 0	2 0	Beet, per dozen .....	1 6	2 0
Sea Kale, per punnet .....	3 6	4 0	Shallots, per lb. ....	0 8	0 0
Potatoes, York Regents, per ton .....	80	0 100	Garlic, per lb. ....	0 8	0 0
Beets, per ton .....	25	0 50	Lettuces, per dozen .....	1 0	0 0
Flukes, per ton .....	110	0 140	Endive, per score .....	1 0	2 6
Kidneys, per cwt .....	8	0 12	Artichokes, per dozen .....	4 0	6 0
Carrots, per bunch .....	0 4	0 6	Eboracian, per bunch .....	1 0	4 0
Furnips, per bunch .....	0 4	0 6	Mushrooms, 3 pottle .....	1 0	2 6
Celery, per bundle .....	1 0	1 6	Farsley, per doz. bun. .....	2 0	4 0
Cucumbers, each .....	0 6	1 0	Herbs, per bunch .....	0 6	0 0

## LEADENHALL LEATHER MARKET.

LONDON, SATURDAY, NOV. 25.—Moderate supplies of leather are on sale. Dressing hides, calf-skins, offal, and medium English butts move off steadily at full prices, otherwise the leather trade is quiet, on former terms. Raw hides are in slow request at late rates.

## CROP HIDES.

ENGLISH.			
lbs.	lbs.	d.	d.
28 to 35	11	12 1/2	
35 to 40	11 1/2	13	
40 to 45	12 1/2	16 1/2	
45 to 50	14	17 1/2	
50 to 55	16	19	
55 to 60	17	20	

## BUTTS.

ENGLISH.			
lbs.	lbs.	d.	d.
14	16	13 1/2	17
17	20	15 1/2	20
21	24	16 1/2	24
25	28	16	27
30	32	18	30
35	36	20	31

## FOREIGN.

lbs.	lbs.	d.	d.
16	30	11 1/2	18
21	34	11 1/2	20
25	38	11 1/2	22
30	42	11 1/2	24
35	46	12	26
40	50	12 1/2	28
44	54	13 1/2	30

## OFFAL.

ENGLISH.			
English Shoulders	d.	d.	
Do. Cheek and Face.	6 1/2	9	
Do. Bellies	11	13	
Do. Middle do.	11	13	
Foreign Shoulders	10	12	
Do. Necks	8	10	
Do. Bellies	9	10 1/2	
Do. Middle do.	10	12	
Dressing Hide Shoulders	10	12	
Do. do. Bellies	7 1/2	9	
Kip Shoulders	8	7	
Do. Bellies	8	7	

## DRESSING HIDES.

ENGLISH.			
Common	lbs.	lbs.	d.
Do.	30 to 34	11	12 1/2
Do.	35 to 39	11	13 1/2
Do.	40 to 44	11 1/2	13
Do.	45 to 49	12	15
Saddlers	30 to 34	12	16
Do.	35 to 39	13	17
Bulls	10	12	
Shaved	14	16	12 1/2
Do.	17	19	12 1/2
Do.	20	22	12 1/2
Do.	24	26	13 1/2
Scotch do.	16	24	12
Coach, per hide	23s.	to 30s.	

## HORSE BUTTS, SHAVED.

ENGLISH.			
English	d.	d.	
Do.	11	13	15
Spanish	10 1/2	12	14

## BARK, &amp;c.

LONDON, SATURDAY, NOV. 25.

ENGLISH.			
per load of 45 cwt. delivered in	£	s.	d.
London	16	10	17 10
Copple	16	10	18 0
Dutch, per ton	5	0	6
Esambo	5	0	6
Antwerp Trunk	5	0	6
Do. Coppice	6	10	7 10
French	0	0	0
Mimosa Chopped	9	0	10 8
Do. Ground	10	0	11 15
Do. Long	7	0	9 0

## HIDE AND SKIN MARKETS.

LONDON, SATURDAY, NOV. 25.

MARKET HIDES:				
	s.	d.	s.	d.
56 to 64lbs.....	0	3	0	3 1/2
64 to 72lbs.....	0	3	0	3 1/2
72 to 80lbs.....	0	3 1/2	0	3 3/4
80 to 88lbs.....	0	3 3/4	0	4
88 to 96lbs.....	0	4	0	4 1/2
96 to 104lbs.....	0	4 1/2	0	5
104 to 112lbs.....	0	5	to 0	5 1/2

## HORSE HIDES.

ENGLISH.			
English	lbs.	lbs.	d.
without butts	13	16	12 1/2
Spanish, salted,	9	11	13 1/2
without butts,			s. d. s. d.
per hide	6	9	10 0 15 0
Do. do. do.	9	12	11 6 17 6
Do. do. do. inferior	7	10	10 0 12 0
Do. dry do.	8	11	10 0 11 0
Do. do. do.	9	11	10 0 14 0
Do. do. do. inferior	6	9	10 0 14 0

## CALF SKINS.

AV. WEIGHT.			
per dozen	lbs.	lbs.	d.
Do.	30	35	20 30
Do.	36	40	21 30
Do.	40	45	21 30
Do.	45	50	20 30
Do.	50	55	19 30
Do.	55	60	18 30
Do.	60	65	18 30
Do.	75	80	16 30
Do.	85	110	14 30
Welsh, unrounded.			
Av. wght. per doz.	25	35	16 30
Do.	35	50	16 30

## KIPS.

PETERSBURGH.			
Do.	lbs.	lbs.	d.
Do.	4	7	14 30
Do.	7	9	14 30
Do.	11	13	15 30
Do.	11	13	14 17
E. I. drysalted.	8	7	18 30
Do.	7	9	18 30
Do. seconds			15 18
Do. thirds			11 14
Do. inferior			7 10

## SHEEP SKINS.

Bastia, unstrained, per lb.	10	18
Do. strained, per lb.	10	18
Do. facing, per doz.	7s.	2s.
White Sheep & Lambs	"	4 10
Do. strained	"	8 20
Do. aprons	"	10 26
Tan Sheep and Lambs	"	10 26
Sumach skins	"	16 35
Do. skivers	"	16 34
Bark skivers	"	10 26

## SUNDRIES.

HOG SKINS.				s.	s.
Hog Skins, best	each			8	14
Do. seconds	.....			5	8
Seal Skins, split, per dozen				40	70
Do. for bindings				85	75
Calf Skins, Sumach-tanned	.....			30	45
Do. white	.....			30	50
Horse Hides, white, each				8	15
Hide Split, per lb.	.....	7d.	to 11d.		

## CHICORY.

LONDON, SATURDAY, NOV. 25.—Most descriptions of Chicory are in fair demand. On the whole, the trade is steady, at late rates.

DELIVERABLE FROM WHEAT IN BAGS, EXCLUSIVE OF DUTY.  
 Harlingen..... £8 9 to £9 10 | Antwerp..... £9 0 to £9 15  
 Bruges..... 9 0 11 0 | Hamburg..... 8 15 9 6

## WOOL MARKETS.

## ENGLISH WOOL MARKET.

CITY, MONDAY, NOV. 27.—The activity in the demand for Colonial Wool at the sales now in progress has produced a firmer feeling in this market. The amount of business doing is only moderate, yet there are very few holders willing to sell except at enhanced rates. The supply of Wool on offer is very moderate.

## CURRENT PRICES OF ENGLISH WOOL.

FLEECES.—Southdown hoggets..... per lb.			
Half-bred ditto	1 1/2	1 8	1 9
Kent fleeces	1 1/2	2 0	2 0
Southdown ewes and wethers	1 1/2	2 0	2 0
Leicester ditto	1 1/2	2 0	2 0
Sorts—Clothing	1 1/2	2 11	2 11
Combining	1 1/2	2 0	2 0

## LIVERPOOL WOOL MARKET.—Nov. 25.

SCOTCH.—There is still a limited demand for Laid Highland, but the stocks are light and no pressure to sell. In Cheviots a moderate business is doing about late current rates.

Laid Highland Wool per 24lbs.....			
White Highland do.	23	0	36 0
Laid Cheviot do. unwashed	23	0	30 0
Do. do. washed	24	0	38 0
White Cheviot do. washed	40	0	48 0

FOREIGN.—There has been a fair demand and considerable business done during the week at full late current rates, no doubt stimulated by the advance obtained at the colonial sales now in progress in London.

WOOL.—FRANCE: At Havre, Buenos Ayres wool, in a dirty state has made 1s. 5 1/2d. to 2s. 2d.; Montevideo, in a dirty state, 1s. 5 1/2d. to 2s. 2d.; and La Plata sheep's hides 1s. 1d. to 1s. 2d. per kilogramme (a kilogramme is the fiftieth part of an English cwt.). At Marseilles, washed Syrian has made 2s. 3 1/2d., and Persian 1s. 9d. per kilo.

## MANURES.

## PRICE CURRENT OF GUANO, &amp;c.

Peruvian Guano, direct from the importers' stores, or ex ship (80 tons)			
£12 5s. to £13 10s. per ton.			
Bones, £8 10s. per ton.			
Animal Charcoal (£70 per cent. Phosphate) £5 per ton.			
Coprolite, Cambridge, whole £3 5s. to £3 8s., ground £3 15s. to £3 18s.			
Guano, whole £11 10s. to £12, ground £3 10s. to £3 15s. per ton.			
Muriate of Potash, £13 to £14 per ton.			
Nitrate of Soda, £15 to £16 10s. per ton.			
Sulphate of Ammonia, £14 to £15 per ton.			
Gypsum, 5s. per ton. Superphosphate of Lime, £5 to £6 5s. per ton.			
Sulphuric Acid, concentrated 17 1/2d. per lb., brown 17 1/2d.			
Blood Manure, £5 5s. to £7 10s. per ton. Dissolved Bones, £5 15s. p. ton.			
Linseed Cake, best American barrel, £11 5s., ditto bag £10 10s. p. ton;			
English, £11 to £11 10s. Rape Cake, £5 15s. to £6 per ton.			

E. PUSSELL, London Manure Company,  
 116, Fenchurch Street, E.C.

Guano, Peruvian £13 7 6 to £20 0 0			
Do. Upper do.	8 0 0	7 0 0	0 0 0
Kooria Moorla	0 0 0	0 0 0	0 0 0
Bone Ash	0 0 0	0 0 0	0 0 0
Brimstone, 34 3rd	0 0 0	0 0 0	0 0 0
Saltpetre, Bengal,	0 0 0	0 0 0	0 0 0
3 per cent.	0 0 0	0 0 0	0 0 0
Nitr. of Soda, p. cwt. 0 13 0	0 14 0	0 14 0	0 0 0
Cloverseed, Amer.	0 0 0	0 0 0	0 0 0
red, new per cwt.	0 0 0	0 0 0	0 0 0

SAMUEL DOWNES AND CO., General Brokers,  
 Exchange Court, Liverpool.

## Agricultural Chemical Works, Stowmarket, Suffolk.

Frentice's Cereal Manure for Corn Crops..... per ton			
Mangold Manure	8	0	0
Frentice's Turnip Manure	6	0	0
Frentice's Superphosphate of Lime	6	0	0

END OF VOLUME XLVIII.













